Book B

Mathematical, Astronomical, Philosophical and
Literary Journal -- and miscellaneous matter
as it occurs to my mind.
Commencing April 1804 --

Contents

Needle's Variation Remarks on-

A. Course of the monument Line on East Mountain in 1802 as determined by my Brother Cap. Hoyt, N 3W. [ ] Line, laid North by the needle about 1740; Variation 3 degrees in about 60 years, approaching the meridian. Since which time (1802) up to 1830 the needle has moved about 2° toward the west, or is receding from the meridian, and more rapidly than formerly to the East. ~~Why the change~~

In 1812 the variation was 5°28W. In 1730 it was a little over 7°W. in this Town. Why the change? The needle, I am inclined to believe, takes a direction, at all places, according to the action of the ferrugeous substance within its influence. If then those substances alter the force their action the needle must vary its direction. If this hypothesis is correct, it only remains to account for this alteration of attraction. And here we are much in the dark, and must so remain until we have more data. From the uncertainty of the variation, at different times, the tracing of old times, is rendered difficult , especially where old boundaries are lost. If however the exact variation was always known and noted on plans of surveys, and its quantity determined at the time of the resurvey, the difficulty would in some measure be obviated.
From an investigation of the muntn I have made of the Courses of old Lines, it appears that the change of the motion of the needle must have commenced about 1812; At this time the Variation may be put at 5.30 West. In 1832 it was 7° and nine west; therefore the needle in 20 years has receded from the magnetic meridian 1°30"+x= 5'..30 + x+ 1 +30= 7 +x, at the rate of 4'30"+x per year
Suppos in 1800, a [ ] N20E what is the course in 1832. In the first 12 years, the ∟ was = 20° -36' (allowing 3'per year to the east) = 19°24. The following 20 years that =19°,,24'+1°40'= 21°04 for [ ] Course

See article Variation 18 vol. Edinburgh Encyclopaedia Hansteens Theory.

1804 Article 1

April Latitude of Deerfield, by Meridian Alt. of the Sun
April 15th 1804 the apparent alt. of the Sun, by a Quad
rants graduated by concentric circles to __ tenths of a degree, was
found to be 57°-10. Sun on Meridian and lower limb observed

Operation for Lat ~

Meridian Alt of lower Limb	57°10’	
Semi-diameter for 15 April	+ 15..58”	by Nautical Almanac
	57 -25..58	
Refraction Subtracts	- 37	
True Central Altitude	57 – 25-21	subtract from 90
	90	
Zenith Distance	32-34-39	

Suns Declination at noon at Deerfield +9—27.01 see operation below.
Lat. of Deerfield Meeting House 42- 27. 01

Operation for Declination.

Decl. at Noon at Greenwich by Naut. Almanac-		9°- 47’-50” N.
Variation for 75° West Longitude (nearly that of Deerfield)		+ 4-32
Decl. at Deerfield at Noon		9-52-22 N

Latitude by Meridian alt of Star Regulus.

Alt. (apparent)	60° 30’	
Refraction	33	
True Alt.	90	
Zen. Distance	29.30.33	
Declination	+12 54.52	see below
Latitude	42.25.25	operation

Operation for Regular Declination. 1804
April

Declination by Decl. [ ] (taken from Bowdditch) for 1800
Viz. 12°-56'N.
1..08 subtract
Annual Variation 17.2" x 4 years= 12.54..52
Decl. of Regular

Lat. by ʘs meridian Alt 42°- 27'-01"
Do by Regular 42 .25..25
2) 84..52.26(
Mean deduced from both observations 42..26..13=lat Deerfield Meet. House
N.B. In the above calculations, no correction for [ ] and
Aberration~ This result is found, by other observations, to small by about 6'

2

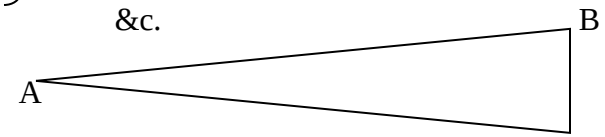
May 25 1804

Examined the lines of the Lots in Newfort extending through Grass Hollow to Deerfield River. Found two Ancient Stones on the Line between Doct. Williams & Elijah Russell. One near the west end of the Lot standing in a trespass road leading through Grass hollow to Amsdens Hill. The top of this stone was rather below the surface of the Earth having been covered by the increments of the floods. The other stone is 40 or 50 rods from the River, in the plowed ground and is about a foot above the precipice.
Began at the west stone and ran E 3°-35'S At 22 rods put up

up a stake marked A; At 40 rods put up a stake B:
at 60 put up a stake C; at 80 put up a stake D; at 109
rods found the Course 28 links north of the East stone.
The Bushes being thick, which rendered running difficult
it was [ ] advisable to calculate off sets at each stake
by similar Δs, and they were found as follows.

At stake A- 5,6 Links nearly
B- 10,3
C- 15, 4
D- 20,6
on the intermediate trees

These distances were carefully laid off, from the several stakes, to the South, for the tree Line. and marks made &c.

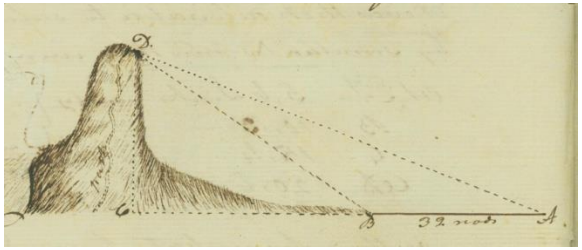


Operation for the true Course C

In the ΔABC, there is given sides AB & BC & ∟B to find ∟BAC
Then AB: Rad.:: BC: Tang. ∟BAC=35'+- Then E3°-35' S +
35'=4°-10' Or E 4°-10' South.
With this Course, E4°-10'S, or rather with E4°.05' S the lower
fibre of the index towards the East, I ran a Line be
tween Doct Williams & Capt. Nims, in the same tier of lots;
through Grass Hollow to the River, and came out very
satisfactorily to the parties. This course ~~is~~ probably is the
true Course of the Lots in the Division of Land.~

Height of the South Sugar Loaf Hill near
Harris, Ferry, by a Trigonometrical Calculation

Observations taken in the level Field west of Mr Harris
house



A Θ1. Alt. - 21°- 57’
B Θ2. Alt. – 34-32
Distance of Θs 32 Rods

∟DBC 34°-32’= ∟A + ∟ADB. (Euclid 1. 32) Therefore
Angle DBC 34..32-- ∟A= ∟ADB= 12°.35’- AB 32 Rods-528 feet.
In the Δ ABD there is given ∟s A & ADB, and side AB
to find BD

Sine ∟ADB=12°-35’	9.33818
: AB= 528 feet	2.72263
::Sine ∟A= 21°-57	9.57264
	12.29527
	-9.33818
:BD=905.9 feet	2.95709

Note the point D is the east edge of the flat Rock known
by the name of the Table For

1804 For the Line CD the proportion is thus

Radius	10,00000
:BD= 905,9 feet	2.95709
::Sine ∟CBD=34°32’	9,75350
:CD= 513,5 feet	2,71059 Height of the Table

Height of the Table	51335
Add 7 feet for highest	(7) point of the Mountain
	520.5

Hence it appears that the perpendicular height of the Mountain above the surface of the Field west of Harris, House is 520.5 feet ~

The top of this Hill is of an elliptical form, the two Dia meters about 10 & 20 rods, and is covered with timber. About half of the East side is perpendicular and viewed from the east, presents to the eye a Rock of a redish colour. The plain on the South and west sides is higher than that on which the ~~the~~ observations for the angles were made, and consequently the Hill is not so high on these sides as on the east. When viewed three or four miles south of it the appearance is similar to that of an acute cone shooting high into the air except on the east side which approaches too near a perpendicular. From this appearance it has its name --Sugar Loaf -- The prospect

prospect from the top is delightful & extensive, particularly
from the northeast viewed by the south to the N west. The
view to the north is obstructed by the north Sugar Loaf
(a hill rather higher than the one we are describing) &
a range of high hills which commence at this point
and extend northerly through the east part of Deerfield
dividing the town street from Connecticut River, and
terminating in Greenfield a little below the mouth of fall River. Through
this range of hills Deerfield River according to the opinion of many has forced a passage
about half a mile from its mouth, which is now cut
down to the level of the Meadows which lies west of
the above mentioned range of Hills. A tradition, handed
down from the aborigines tells us that an old Squaw
began this passage for the River with a Clam Shell.
Whether we are indebted to the Old Squaw for this
passage or to some convulsion of Nature I will
not undertake to determine, but from a variety of
appearances I think it may be asserted as highly
probable that the greater part of the Land which
the town street occupies as well as the whole of the
meadow adjoining was formerly the bed of a Lake,
and that the ~~river has been~~ Mountain at the Rocks below Cheapside
Bridge once formed a dam over which the water of the
Lake was precipitated into the channel leading into Connecticut
River.

In support of this Hypothesis may be mentioned the vast

quantities of logs and other drift Wood; and even grass and the leaves of trees which are brot into view by the wearing of the Banks of the River by the floods, in every part of the meadow. Some of these are found 10 or 15 feet below the present surface, and the Land over them is composed of different strata entirely free from stones. Now let us suppose a Dam to be erected at the rocks, below the Bridge, as high as the mountain on each side of the River, the effect would be a compleat innundation of all the Land, in the intervail between the Mountain, below the level of the Dam; and a Lake would be produced according to the supposition. Through this lake the River would pass, and a great proportion of the driftwood and vegetable like substance brought down the River ~~into the Lake would~~ after lying some time in the Lake subside to the bottom, and ~~after lying [ ] [ ] in the Lake~~, and ~~would~~ be covered by the Sediment of the floods and then the bottom of the Lake would be continually rising. If we suppose this Dam to consist of substances that might be worn away by the water, it follows that it would in time be entirely removed and the Lake would ~~entirely~~ drain off and leave a bottom of rich Land composed of strata of earth and Logs similar to the that which in fact composes our Meadow.

Note The hill through which Deerfield River has cut a passage is composed of green stone or basalt, forming a dyke, extending from Gill in Mass to New Haven in Connecticut. Hexagonal columns are found on the west side in many places.

4 New Method of Purifying Water which is [c]orrupt.
To a puncheon of foul water add half an ounce alum previously disolved in a pint of warm water, which will render the former, in forty eight hours, as clear as that of the finest spring-- European Magazine vol 43 Page 158

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5 White-wash --A few handfuls of sea salt, mixed with about one cwt. of Lime, to be used in white-wash, will make it adhere to the wall and destroy insects.
Same Magazine and Page

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6 Of the purifying property of Charcoal~
Amongst other singular properties of charcoal, it has lately been discovered by a gentleman at Petersburgh, that all sorts of Glass vessels, and other utensils, may be purified, from long retained smells and taints, of every kind, in the easiest and most perfect manner, by rinsing them out with charcoal reduced to a fine powder after their grosser impurities have been scoured off with sand and potash --- That people whose breath smells strong from a ~~strong~~ scorbutic disposition of the gums, may at any time get perfectly rid of this bad smell, by scrubbing and washing out the Mouth thoroughly with fine charcoal powder. This simple application, at the same time, renders the

the teeth beautifully white. And that brown (or otherwise colored) putrid stinking water may be deprived of its offensive smell & rendered transparent by means of the same substance. Hence he thinks it would be of use for preserving water sweet during sea voyages, to add about 5 lb. of coarse charcoal powder to every cask of water; it being only necessary afterward, to strain the water off when wanted, through a linen bag. see this last Number of the Translation of Cruell's Chemical Journal.

Same Magazine vol.21 Page 24

1805 January 15th } 7

Observations made by Mr. Allen Greely and myself on the Lunar Eclipse January 15--1805

	H ms	
Beginning of the Eclipse	1..55..52	apparent
Do total darkness	2..51..19	time in
End of total darkness	4..30..02	morning
Do of Eclipse	5..30..05	by clock

The clock was set by a regular going watch, which was adjusted by a Meridian in my office, north of the meeting House, on the 14th at noon. This meridian was drawn by a stellar observation; yet it is probable that it is not perfectly true, for the observation was not made with a very suitable Instrument: but

as the suns declination, at the time of the Eclipse, was
about 21° 15’ South & consequently his altitude small
it was thot safer to adjust by this meridian, than to
trust to the [ ] of the time by corresponding altitudes
of the Sun; or one altitude as practiced at Sea~ At noon
on the 15th the watch was found to have gained 5 minutes.
By several Days observation, previous to the eclipse, the Clock
was found, neither to gain nor loose time; but as it was
put with the watch at 9 oclock in the evening it
must have been, at the time the observations were
made, 1’..52”-30’’’ feet, as appears by the following op
peration.

H m H
As 24 : 5 :: 9 : 1’.52”..30’’’

```
      5
24| 45|1’
   24
   21
  x60
|1260|  52”
|120  |
   60
  48
   12
 + 60
 |720|   30’’’
|72|
   0.
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To find the difference of time, and Longitude from
Greenwich.

Beginning of the Eclipse at Greenwich by N. Almanac

	H	m	s
Civil time	6-	42	00
Do at Deerfield		1..	55..52
Diff	4..	46..	08

		H m
Beginning total darkness at Greenwich		7 –40
Do at Deerfield		2..51..19
	Diff	4”48”41
		H m s
End of total Darkness at Greenwich		9 ..19
Do at Deerfield		4..30..02
	Diff	4..48..58
End of Eclipse at Greenwich		10..17
Do at Deerfield		5..30..5
	Diff	4”46”55

Add	H m s
First difference	4..46..08
Second Do	4..48..41
Third Do	4..48..58
Fourth Do	4..46..55
Sum=	19..10..42- thirds
Divide	4| 4..47..40..30
Clock fast add	1..52..30
Mean diff. of time	4..49..33..00 between Deerfield & Greenwich

This converted into degrees &c of Longitude, gives 72°..23’..15” for the

Thus 4 hours = 60° } Longitude of Deerfield West
49 minutes =12..15 } from Greenwich
33 seconds = 0..8..15
72..23..15

NB The Eclipse was observed with a pocket Telescope mounted on a Compass staff. The weather very severe & the Thermometer in the morning 10 below Zero. The Atmosphere clear & still~

8

Copy of a Letter to a Gentleman who requested information concerning the cankerworm.

Deerfield February 18. 1805

1805 Sir,

In compliance with your request I communicate to you, a statement of the ravages and final disappearance of the cankerworm in this town.

The time of their first appearance I am not able precisely to ascertain, but from my best recollection, and that of others, of whom I have inquired, it must have been about the year . For several years succeeding this, they appeared regularly in the spring, upon the apple trees of most, or all of our orchards. On their first appearance in the spring, which was as soon as the leaves had first put out, they were small, but soon arriving to their full growth, they devoured all vegetation upon the trees, which to a spectator at a distance appeared perfectly dry and similar to that of dead orchards. Many of these, composed of flourishing trees were intirely destroyed. In the spring of 1794 vegetation was very forward: the worm appeared appeared as usual and we again dispaired of our apples. On the night of the 17th day of May we had a severe frost, followed by a fair and pleasant morning, the sun shining in full luster. By noon the effects of the frost were fully visible. Indian

corn

1805 corn, peas, oats, flax, rye, and even the leaves of our most hardy trees were dead. The effluvia from the wood was similar to that from a piece of land newly cut over. Every vegetable which had put out seemed to be intirely cut off. But, in due time, vegetation again appeared, but not one of the worms was to be seen; nor have they since appeared in this town.

The worm here mentioned is commonly called the canker worm.‡ They are about an inch in length, and very slender, not exceeding in thickness a common coarse knitting Needle: and of a dark colour, approaching nearly to a black. Being furnished with legs at each extremity of the body, they are able to move with a considerable facility and expedition. This is performed by extending out the body nearly in a right line, and holding fast by the fore legs, then bringing up the hind part nearly to the fore, forming with the body a kind of semi ellipsis on the conjugate, or shortest diameter, then again extending the ~~[ ] part of the~~ body as before, & thus alternatively so long as they continue to move.

When these worms were very numerous upon a tree their destructive & voracious gnawing distinctly heard. On striking a limb with a staff, hundreds of them would spin to the ground upon a small thread or fibre, exactly like that of the spider. After they have stripped the tree of its

‡Phalaence wanania

its verdure they disappeared and were not again seen
till the next spring.

1805 That this worm is produced from the egg of the
miller, a small flying insect, is rendered highly pro-
bable, if not certain, from the following circum-
stance. Early in the spring & in the edge of the evening
vast numbers of them were seen ascending the body
of the trees by fluttering and climbing along their
surfaces. The female was found to be loaded with
eggs which rendered her ascent very slow and dif-
ficult. To prevent their ascent some of our people
encircle their trees with tar and renew it every
day, which by its adhesive quality effectively pre-
vented the ascent of the miller: and thus some or-
chards were saved from their depredations.

I observed last summer that these destructive insects
were ravaging the orchards in Sudbury in
this state--are we not in danger of introducing them
among us, unless we use some precautions? Does not
prudence dictate, that we should avoid approaching
too near the trees with waggons & other carriages
on their return from Boston? that we should be

1805 cautious of their hay, and see that none of it is put
into the waggon, to avoid taking in with it some of
these worms? Are they not frequently transported, in
this manner, from place to place?--I will here con-
clude for I fear I am wandering from the subject with which I
began, by introducing matter foreign to your request.
If so, I beg your pardon----promise to do better another time.

And am Sir, your humble

Mr. Servant--

E.H.

In page 106, vol 3 of Doct. Belknaps "History of New Hampshire"
it is asserted that the cankerworm disappears by the 21st of June-
That the miller comes out of the ground early in the spring.

He says "they were not known in New Hampshire till about
twenty years past‡, and there are some parts which they
have not yet reached." He adds "they do not appear every
year, but there is no regular interval between their appear-
ances, nor is the cause of the interruption known"--

From the known accuracy of the Doctor's History I presume
his statements are, in general, correct, tho' there was no fixed in-
terval, in these appearance at Deerfield, after they first began
their ravages, untill they were destroyed by the frost~

‡now 32 years

9 Outlines of Chemistry

Chemistry, is a science, the object of which is to ascertain the ingredients that enter into the composition of bodies, to examine the nature of these ingredients, the man- in which they combine, and the properties resulting from their combination.

As a science it is intimately connected with all the Phenomena of Nature; the causes of rain, snow, hail, dew, wind, earthquakes; even the changes of the seasons can never be explored with any chance of success while we are ignorant of Chemistry; and the vegetation of Plants, and some of the most important functions of an- imals have received all their illustrations from the same source. As an art. it is intimately connected with all our manufactories: The glassblower, the pot- ter, the smith and every other worker in metals, the tanner, the soapmaker, the dyer, the bleacher, are really practical Chemists; and the most essential

improvements have been introduced into all these Arts by the progress which chemistry has made as a science. Agriculture can only be improved rationally, and certainly, by calling in the assistance of chemistry; and the advantages which medicine had derived from the same source are too obvious to be pointed out.

Part 1. Of Simple Bodies

All the bodies which are at present reconed simple, because they have never been decompounded, may be rendered into Six Classes

1 Oxygen	4 Earths
2 Simple Combustibles	5 Calorie
3 Metals	6 Light

Chap 1 of Oxygen----

Take a quantity nitre, or saltpetre as it is also called, and put it into a gun barrel, the touch hole of which has been previously closed up with metal. The barrel is to be bent

in such a manner, that while the close end, in which the nitre lies, is put into a fire, the open end may be plunged below the surface of the water in an open vessel. At the same time, a glass jar, previously filled with water, is inverted and placed on a support lying at the bottom of the vessel so as to be exactly over the end of the Gun Barrel. As soon as the nitre becomes hot, it emits a quantity of air, which issuing from the end of the gun barrel, ascends to the top of the glass jar and gradually displaces all the water. The glass jar then appears to be empty, but is in fact filled with air. It may then be removed in the following manner; slide it away a little from the gun barrel and the support, and then dipping any flat dish into the water below it raise it on it and bear it away. The dish must be allowed to retain a quantity of water in it.. Another jar may then be filled with air in the same manner.

All the airs obtained by this or any other process, or, to speak more properly, all the airs differing from the atmosphere, have in order to distinguish

them from being called Gases ----The gas obtained by the above process has been called by various names. By Doct. Priestly dephlogisticated Air by Scheele of Sweden empyreal air --by Condanest vital air. Mr. Lavoisier gave it the name now generally named oxygen gas.

Oxygen may be obtained likewise by the following process..

Into a glass vessel with a narrow neck put a quantity of black oxyd of manganese in powder, and pour over it as much oil of vitriol, or sulphuric acid, as will somewhat more than cover it. Then insert into the mouth of the vessel a glass tube, so closely that no air can escape except through the tube. This may be done by covering the joining with a paste made of wheat flour & water, or any other lute, as substances used for similar purposes are called. A jar is then prepared and placed over this tube exactly as described in the preceding process. The vessel containing the manganese is heated by means of a Lamp or candle, a great quantity of oxygen gas rushes along along the tube and fills the jar, and then as many jars as may be filled as are required. oxygen

Oxygen is colorless and invisible like common
air. Like it too, it is elastic, and capable of indefinite
expansion & compression. A lighted taper burns
in it with such a splendor that the eye can scarcely bear the glare of light,
and at the same time produces a much greater heat
than when burning in common air. Animals inclosed
in it will live much longer than those in common air.

Atmospherical air contains about 27 parts in
the hundred of Oxygen gas. No substance will burn
in common air previously deprived of all the oxygen gas
which it contained, but combustibles burn with great
splendor in oxygen gas, or any other gas to which
oxygen gas has been added. Oxygen gas then is
absolutely necessary for combustion. No breathing animal
can live for a moment in any air or gas which
does not contain oxygen mixed with it. Oxygen gas
then is absolutely necessary for respiration.
Oxygen is capable of combining with a great number
of bodies and forming compounds.

All substances which are capable of combining to
gather are said to have an affinity for each other;
those substances, on the contrary, which do not unite,
are said to have no affinity for each other. Thus

then

then there is no affinity between water and oil.

Substances differ in the degree of their affinity for each other. A method of representing these different degrees is by Tables, called Tables of Affinity Thus

Water	Ox[y]gen
Spirit of wine	Carbon
Common salt &c	Zinc
	Iron &c

The substances whose affinities are to be ascertained are placed at the top of the column, and the substances with which it unites, below it, and in the order of affinity; the substance which had the strongest affinity next it, and that which had the weakest farthest distant, and so of the next.

Chap 2d Of Simple Combustible Bodies

By combustibles, is meant substances capable of combustion; and by simple combustibles, bodies of that nature which have not yet been decompounded. These are only five in number viz. Sulpher, Phosphorus, Carbon, Hydrogen, and Azot.

of

Section 1 Of Sulpher

Sulpher is a hard brittle substance, commonly of a yellow colour, without any smell, and of a weak though perceptable tas[t]e. It's generally distinguished by the name of Brimstone.

When Sulpher is heated to the temperature of 302° in the open Air, it takes fire spontaneously and burns with a pale blue flame, and at the same time emits a great quantity of fumes of a very strong suffocating odour. When heated to the temperature of 570°, or a little higher, it burns with a bright white flame and at the same time emits a vast quantity of fumes. If the heat be continued long enough, the sulpher Burns all away without leaving any ashes or residuum . if the fumes be collected they are found to consist entirely of sulphuric acid. By combustion then sulpher is converted into an acid.

The famous Stahl advanced a Theory to explain this process, which was, in a very short time adopted by all the Philosopher world.

According to this theory, there is only one substance in nature capable of combustion, which Stahl called

Phlogiston; and all those bodies which can be set on fire contain less or more of it. Combustion is merely the separation of this substance. Those bodies which contain none of it are of course incombustible. All combustibles, except those which consist of pure phlogiston (if there be any such), are composed of an incombustible body and phlogiston united together. During combustion the phlogiston flies off, and the incombustible body remains behind. Now when sulpher is burnt, the substance which remains is sulphuric acid, an incombustible body. Sulpher therefore is composed of sulphuric acid and phlogiston.

This theory has been found, by experiments recently made, unsatisfactory. Mr Lavoisier undertook the examination of the subject. According to his experiments, the combustion of sulpher is nothing else than the Act of its combination with oxygen; and for anything which we know to the contrary, it is a simple substance.*

Section 2d Of Phosphorus--

Phosphorus when pure is of a clear, transparent yellowish colour but

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‡The phlogistic theory is generally exploded by the late chemists. Lavoisier says, there is no proof whatever of the existence of any such substance as phlogiston in nature. Doct Priestly on the contrary asserts the existence of phlogiston and advances arguments in its favour which he thinks cannot be controverted by the antiphlogistam.

but when kept some time in water it becomes opaque, and then has a great resemblance to white wax. Its consistence is nearly that of wax: it may be cut with a knife, or twisted to pieces with the fingers. It is insoluble in water; it melts at the temperature of 90∘, and even at 67∘ it gives out a white smoak and is luminous in the dark, ~~at the same it [ ] odour~~ that is to say, it suffers a slow combustion: so that it can only be prevented from taking fire by keeping it in a very low temperature, or by allowing it to remain always plunged in water.‡

By the combustion of phosphorus in oxygen gas, phosphoric acid is produced. The combination then of phosphorus, like that of sulpher, is nothing else than the combination with oxygen. This acid is composed of 100 parts phosphorous, and 154 oxygen.

Phosphorus is capable of combining with many bodies. The compounds produced are called phosphurets.

Section 3d. Of Carbon

If a piece of wood be put into a crucible, well covered with sand, and kept red hot for some time, it is converted into a black shining brittle substance, without either, or smell

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‡The process for making phosphorus is described Page 262 1 vol. Sup Encyclopaedia Sct 2. art Phosphorus

smell, well known under the name of charcoal. This substance contains always mixed with it several earthy and saline particles. When freed from these impurities it is called carbon.

Charcoal is insoluble in water; it is not affected (provided that all air be excluded) by the most violent heat which can be applied, excepting only that it rendered much harder. When heated to the temperature of 370 it takes fire, and provided it has been previously freed from the earth & salts which it generally contains, it burns without leaving any residuum

Carbon is susceptible of crystallization. In that state it is called Diamond. The figure of the diamond varies considerably; but most commonly it is a hexagonal prism terminated by a six sided Pyramid. When pure it is colourless and transparent.

Charcoal possesses a number of singular properties, which render it of considerable importance. It is incapable of putrifying or nothing like wood and therefore is not therefore liable to decay through Ages. This Property has been long known. It was customary among the ancients to char the outside of those stakes which were to be driven into the ground or placed in water, in and on to preserve the wood from spoiling. It takes away the bad taint from meat beginning to putrify, by being boiled with it.

For its further properties see page 8 of this journal.

Carbon unites with a number of bodies, and forms with them compounds known by the name of carburets.

Section 4. Of Hydrogen

Put into a glass vessel furnished with two mouths, a quantity of fresh iron filings, quite free from rust. Slip into one of these mouths the end of a crooked glass tube. Insert the other end of this tube below a glass jar filled with water, and inverted in to a pneumatic apparatus. Then pour upon the iron filings a quantity of sulphuric acid, diluted with twice its own weight of water, and close up the mouth of the vessel. Immediately the iron filings and acid effervesce with violence, a vast quantity of gas is produced, which rushes through the tube and fills the jar. This gas is called Hydrogen gas.

Hydrogen, like air, is invisible & elastic & capable of indefinite compression and dilation. It is about 12 times lighter than common air. It is capable of supporting combustion. Animals die in it almost instantaneously. When mixed with oxygen gas it will burn. If 85 parts by

weight

weight of oxygen, and 15 of hydrogen gas, be mixed together, and set on fire in a close vessel, they disappear, and in their place there is found a quantity of water exactly equal to them in weight. This water must be composed of these two gases, oxygen and hydrogen; and the combustion of hydrogen is nothing else, but the art of its combination with oxygen.

Hydrogen gas dissolves sulpher, phosphorus, and carbon. The compounds are called sulphurated, phosporated, and carbonated hydrogen gas.

Sulphurated hydrogen gas has a very fetid odour, precisely similar to that emitted by rotten eggs. Phosphorated hydrogen gas has a smell resembling that of putrid fish. When mixed with oxygen gas or common air it becomes luminous-- Carbonated hydrogen gas arises spontaneously in hot weather from marshes, but always mixed with several other gases.

Section 5 Of Azot

If a quantity of iron filings & sulpher, mixed together and moistened with water, be put into a glass vessel full of air, it will absorb all oxygen in the course of a few days; but a considerable modicum of air still remains incapable of any furthur diminution. This residuum has obtained the appellation of azotic gas.

The air of this atmosphere contains about 73 parts of azotic gas; about all the rest is oxygen gas. The easiest method of procuring azotic gas is put some sullpherret of potass into a glass vessel filled with air, & accurately closed, and then to apply heat to the sulpherel. All the oxygen is absorbed almost instantly. This gas is exceedingly noxious to animals; if they are obliged to respire it they drop dead almost instantly. No combustible will burn in it.

Azotic gas is capable of dissolving phosphorus and also a little carbon. These two solutions are called phosphorated and carbonated azotic gas.

From the foregoing it appears that during combustion, all the combustibles which are at present reckoned simple, combine with oxygen; that no part of them is disengaged. No part of them lost; hence it is concluded that the combustion of these substances is nothing else but the act of them uniting with oxygen; and it appears that in order to produce this union heat is necessary. This may be different according to the nature of the substance. Phosphorus uniting with oxygen in the common temperature of the atmosphere, in other words suffers a slow combustion.

Chap. 3 Of Metals

Metals may be considered as the great instruments of all our improvements: Without them, many of the arts and sciences could hardly have existed.

1. One of the most conspicuous properties of metals is a particular brilliancy which they possess, and which has been called the metallic lustre.

2.They are absolutely opaque, or impervious to light, even after they have been reduced to very thin plates.

3. They may be melted by the application of heat, and even then still retain their opacity.

4. Their specific gravity is greater than that of any other body hitherto discovered.

5. They are better conductors of Electricity than any other body.

6. One of their most important properties is malle-ability, by which is meant the capacity of being extended & flattened under the hammer.

7. Another property which they possess is ductility, by which is meant the capacity of being drawn out into wire, by being forced through holes of various diameters. This property has by some been termed tenacity --All the metals do not possess the property of ductility and malleability.

8. When exposed to the action of heat and air, most of the metals lose their lustre and are converted into earthy-like powders of different colours & properties according to the metal and degree of heat employed. If any of these calces, as they are called, be mixed with charcoal-powder, and exposed to a strong heat in a proper vessell, it is changed again to the metal from which it was produced. The calces are all considerably heavier than the metals from which they are obtained.

From the experiments of Lavoisier it is concluded that calcination is merely the art of uniting the metal with oxygen.

All the metallic calces may be decomposed by presenting to them substances which have a greater af

affinity for oxygen than they have. This is the reason that charcoal powder is so efficacious in reducing them. During the reduction a great deal deal of carbonic acid gas comes over, which together with the metal is equal to the weight of the calx and the charcoal: it must therefore contain all the ingredients; and we know that carbo[l]ic acid gas is composed of carbon and oxygen. In the process, then the oxygen and calx combine with the charcoal and the metal remains behind.

The word calx and calcination are now laid aside and in their stead, the words oxyd and oxydation are used. A metallic oxyd signifies a metal united with oxygen; and oxydation implies the art of that union.

Metals are capable of uniting with oxygen in different proportions, and, consequently of forming each of them different oxyds. These are distinguished from one another by their colour. One of the oxyds of iron for instance, is of a green colour: it is therefore called the green oxyd; the other which is brown, is called the brown oxyd.

The metals, at present known, amount to 21.

Their names are gold, silver, platinum, mercury, copper, iron, tin, zinc, antimony, bismuth, arsenic, nickel, manganese, tungsten, molybdenum, uranium, tellurium, titanium, chromium.

The first eight of these were formerly called metals by men of eminence because they are possessed either malleability or ductility or of both properties together; the rest are called semimetals because they are brittle: But this distinction is now pretty generally laid aside.

Of these metals, four are found to [be] magnetic viz. iron, Cobalt, Nickel, & Manganese.

Section 1 Of Gold

It is of an orange red. or reddish yellow colour and has no perceptible taste or smell. No other substance can be compared with it in ductility and malleability.

It is capable of combining with oxygen and forming an oxyol of gold. There are two methods of producing

producing this combination, the application of heat & solution in acid. When it is exposed to a violent heat in contact with air, gold absorbs oxygen. But the temperature must be very high; so high indeed that hardly any certain method of oxydating gold by heat is known, except by electricity.

Gold is capable of combining with most of the Metals.

Section 2. Of Silver.

Silver is a metal of a shining white colour, without any taste or smell. It is the most malleable and ductile of all metals except gold, and perhaps platinum. It may be volatilized with a violent heat. It may be combined with oxygen & converted into an oxyd by exposure to a violent heat. By this method it has been converted into a glass as oxyds after fusion, are called, because they acquire a good deal of resemblance, in some particulars, to common glass.

Little is known at present concerning the oxyd of silver, nor whether they are more than two, the black or the blue.

When silver is melted with sulpher in a lowered heat

heat it combines with it and forms sulpheret of silver.

Section 3 Of Platinum

The metals hitherto described have been known to mankind from the earliest ages, and have been always in high estimation on account of their beauty, scarcity, ductility, and indestructibility. But Platinum, though perhaps inferior to them in one of these qualities, and certainly superior in others, was unknown as a distinct metal, before the year 1752.

Platinum, when pure, is of a white colour like silver, but not so bright. It has no taste nor smell.

It is both ductile and malleable. It has been drawn into a wire of $\frac{1}{1940}$ of an inch in diameter. This wire admitted of being flattened, and had more strength than a wire of silver or Gold of the same size. The specific gravity, after being hammered, is 23,000; so that it is the heaviest body known.

Section 4 Of Mercury, or Quicksilver

It is a light colour, exactly like that of polished silver. It has no taste, but acquires a slight odour when rubbed between the hands.

It differs from all other metals in always existing at the common temperature of the atmosphere, in a state of fluidity.

From experiments made on frozen mercury in Russia, Hudson's Bay, and Britain we know that this metal, when solid, is malleable.

Mercury is capable of combining with oxygen and of forming oxyds. The oxyds or Mercury, at present known are the black, the yellow, and the red. These oxyds may be decomposed by the application of heat amounting to 1200∘. The oxygen flies off in the form of gas, and running Mercury remains behind.

Mercury, two parts and flowers of sulpher three parts ?? -cetic for some time together combine and form a black powder, formerly called ethiops mineral, and now black sulpheret of Mercury.

The combinations of mercury with the other metals are called Amalgams, These are various viz. Amalgams of Gold, of Silver, of Platinum, &c.

Section 5 Of Copper

Copper is of a pale red colour with a shade of yellow. Its taste is styptic and nausious; and when rubbed it emits a disagreable smell. It possesses a considerable degree of malleability, though less than silver.

Its oxyds are brown, blue, and green, when long exposed to the air its surface becomes covered with a green crust, which is the green oxyd of copper. This oxydation never penetrates beyond the surface.

It is supposed that the different oxyds are composed of different proportions of oxygen. The brown contains about 84 copper & 16 of oxygen.

Sulpheret of copper is composed of 81 parts copper and 19 of sulpher.

Copper combines with gold when the two metals melted together. Eleven parts gold & one part copper compose the current gold of this Country. The current silver coin of Britain is composed of 15 silver & 1 of copper.

Section 6. Of Iron

Iron is the most useful of all the metals and is found in greater abundance than any other. It

It is malleable and ductile in every temperature;
and its malleability is increased in proportion at the
temperature augments. Its tenacity is such than an
iron wire 1/10 of an inch sustains 450 lb. without break-
ing. When fresh broken it is of a bluish colour.
It has a styptic taste, and emits a smell when
rubbed & is infusible in the strongest heats hither-
to produced.

Iron combines with oxygen very readily. When
kindled in oxygen gas it burns with great rapidity
& splendor and is in this manner converted in to an
oxyd. There are two oxyds the green & brown
or red. The brown is known under the name
of rust of iron, which is combined with carbonic
acid gas.

Sulpheret of iron, formerly called pyrites,
is found ready formed in many parts of the world.

If iron filings and sulpher are mixed together
and formed into a paste with water the sulpher
decomposes the water the water and absorbs oxygen so rap-
idly that the mixture takes fire, even though
burned under ground. May not this afford an expla-
nation of the enigma of volcanos? Nature sulpher-
et has been seen to take fire on being moistened with
water.

Iron combines with carbon and forms a carbu-

net. Carbunet of iron has been long known under the name of plumbago & black lead.
Iron also combines with phosphorus & forms phosphernet of iron; to which has been given the name of Siderum.
There are great varieties of iron distinguished by different names; as wrought iron (or simply iron) steel, & cast iron or raw iron.

Steel is so hard as to be unmalleable while cold, or at least it acquires this property by immersed while ignited into a cold liquid: for this immersion though it has no effect upon iron, adds greatly to the hardness of steel.

It is brittle, resists the file, cuts glass, affords sparks with flint, and retains the magntetic virtue for any length of time.

By being repeatedly ignited in an open vessel and hammered, it becomes wrought iron.

Cast iron is scarcely malleable at any temperature--is generally so hard as to resist the file. It is converted to wrought iron by exposing it for a considerable time in a furnace to a heat sufficiently strong to melt it.

wrought

Wrought iron may be converted to steel by being kept some hours in a strong red heat, surrounded with charcoal powder in a covered crucible. By this process, which is called cementation, the iron gains some weight.

From a number of experiments it is deduced that wrought iron is a simple substance, and if perfectly pure would contain nothing but iron. That steel is iron combined with carbon. The proportion of this last ingredient has, by Dr. Parson been fixed at 1/100 part at a medium. Some elements have called it carburet of iron; but this name seems not to be fully admitted by others. That cast iron is contaminated with various foreign substances, the proportion of which vary according to circumstances. These substances are chiefly oxyd of iron & carbon & sometimes silica.

Iron combines with most metals.

Section 7 Of Tin

Tin is a greyish white colour; it a has strong disagreeable taste, with a peculiar smell when rubbed. It is very malleable: tinfoil is about 1/1000 part of an inch thick and might be beat out much thinner. The

The oxyds of Tin are grey & white.

Tin does not seem capable of combining with carbon. It combines with most of the metals. Mercury dissolves tin very readily, by being poured on it when melted.

The amalgam of tin is used to silver the backs of glass mirrors.

Tin unites readily with cop[p]er and forms alloys known by the names of bronze and bell-metal.

There is an affinity between tin and iron as is evident from their adhesion when the latter is di[p]ed into melted tin. This is the method of making tinplate.

Section 8 Of Lead

Lead is of a bluish white colour, somewhat darker than tin.

It is very malleable & may be reduced to thin Plates by the hammer; but its ductility is very imperfect.

There is a strong affinity between this metal and oxygen. When nitric acid is poured upon it an effervescence ensues, owing to the

de-

decomposition of the acid. The acid seizes oxygen from it, and is converted into a white powder, which may be obtained pure by evaporating it to dryness, and then washing it in pure water. This is the white oxyd of lead. It is composed of about 95 parts of Lead & 5 of oxygen. By another process yellow oxyd formerly called massicot is produced. By heating this sufficiently it is changed to a beautiful red oxyd of lead, formerly called minium, composed of 88 parts lead & 12 of oxygen. Scheele has shown that there is a brown oxyd of Lead.

Lead combines with Sulpher, and Phosphorus; it also combines with most metals.

Section 9 Of Zinc

This is of a bluish white colour, somewhat lighter than lead--has neither taste nor smell. It has some degree of malleability, for by compression it may be reduced into thin plates. It is more brittle when hot than when cold. From it may be obtained a grey & white oxyd: and also a sulpheret & phosphoret & carburet.

Zinc combines with most other metals. With mercury it combines by fusion, and forms an amalgam suitable for electrical purposes.

Zinc combines readily with copper and forms a compound called brass. This is of a yellow colour, more fusible than copper. It is malleable and so ductile that it may be drawn out imto wire. It is composed of three parts copper & one of Zinc. Pinchbeck, princes metal or Prince Ruperts metal contain three parts Zinc & four of copper.

Tin & Zinc combine easily. This alloy is often the principal ingredient in the compound called Pewter.

Section 10. Of Antimony

Antimony is of white colour, with shade of grey. It has a sensible tas(t)e, but no smell + is neither malleable nor ductile, but exceedingly brittle. It melts at 809 Fahrenheit. With a higher heat it evaporates.

The oxyds of Antimony are grey & white. The grey oxid is capable of combining with about 4/100 of Sulpher. This compound by fusion may be converted into glass. It was formerly used in medecine under the name of glass of Antimony. Antimony

Antimony is capable of combining with most of the metals. Sixteen parts of lead & one of antimony form an alloy for printers types, with phosphoric glass a phosphunet of Antimony is formed.

Section 11 Of Bismuth

Bismuth is of a yellowish or reddish colour, & almost destitute of tast or smell. I(t)s brittle, melts at 460F. Its oxyds are brown and white--The sulpheret of Bismuth is of a bluish grey colour.

Bismuth combines readily with most of the metals.

Section 12 Of Arsenic

Arsenic when pure is of a bluish white colour, exceedingly brittle. Its oxyds grey & white-- The white oxyd of Arsenic is one of the most virulent poisons known. The yellow Sulpheret of arsenic was formerly called orpiment. This is often found native.

Arsenic combines with most metals and in general renders them more brittle and fusible. The alloy of copper & arsenic is white and when the quantity of arsenic contained in it is small,

both

both ductile and malleable. It is called white tombac.

Section 13 Of Cobalt

Cobalt is of a white colour, inclining to a bluish or steel grey. When pure, is somewhat malleable, while red not. It is attracted by the magnet. it is not oxydated by heat without very great difficulty; but it has the property of decomposing nitric acid, and of attracting oxygen by that means with great rapidity.
The oxyd of Cobalt is of so deep a blue as to appear black.

The combinations of cobalt of cobalt with other metals have been very little examined.

Section 14 Of Nickel

Nickel is of a greyish while colour, and when less pure inclines to a reddish colour. It is both ductile and malleable--Is attracted by the magnet.

Oxyds. brown and greenish.
Little is known concerning the alloys of nickel with other metals.

Section 15 Of Manganese

This is of a greyish white colour. It is not malleable, and yet not so brittle as to be easily broken. When reduced to a powder, it is attracted by the magnet. When exposed to the air, it very soon tarnishes and assumes a darker colour till at last it becomes black, and friable. This change is produced by the absorption of oxygen. It takes place much more rapidly if heat be applied to the metal. This substance is the black oxyd of manganese. This oxyd is found in great abundance in nature, though scarcely in a state of purity. From this oxyd is produced the white oxyd of Manganese.

Cobalt, nickel, & manganese resemble iron in several particulars; but they differ from it in specific gravity, malleability, and in the properties of all their combinations with other substances.

Section 16 Of Tungsten

This is externally of a brown colour, internally of a steel grey. oxyd

Oxyd. yellow called tungstic acid--alloys little known.

Section 17 Of Molybdenum

This is externally of a whitish yellow colour, but its fracture is of a whitish grey.
Oxyd. white which poseses the properties of an acid. This is molybdic acid. Alloys few have been examined.

Section 18 Of Uranium

Colour dark grey; internally inclined to a brown Oxyd. yellow--Alloys: nothing known.

Section 19 Of Titanium

Colour, brownish red and of considerable lustre. It is found naturally crystallized in right angled quadrangular prisms., longitudinally & about 1/2 an inch in length. No acid will oxydate it. It has no affinity for sulpher.
Oxyd whitish--

Section 20

Section 20 Of Tellurium

Tellurium is of a white colour like tin approaching somewhat to the grey colour of ~~Tin~~ Lead. Is very brittle, but melts easily as Lead. It is so volatile as to rise by heat entirely in a whitish grey smoke; at the same time it exhales a disagreable odour like that of radishes. This smoke is the white oxyd of tellurum.

Tellurium amalgamates with mercury by simple turbination --The other properties unknown.

A new metal has lately been discovered in the red lead ore of Silenia. It is grey, very hard, brittle and easily crystallizes in small needles. The name of Chromium has been given to it, from its property of colouring bodies, in a remarkable elegance.

General Remarks

From the foregoing it appears that all the metals are capable of combining with oxygen; that almost every one forms various oxyds, containing different quantities of oxygen, and varying in colour and other properties according to

to the proportion of oxygen which they contain.

All the metals except gold & titanium are capable of combining with Sulpher, and all of them, on which experiments have been made, can be unite with phosphorus. Iron zinc & manganese will unite with carbon, and perhaps many more of them may hereafter be found capable of forming carburets.

Much is wanting to render the chemistry of alloys complete. Many of them have not been examined; and the proportions of almost all of them are unknown. Neither has any accurate method been yet discovered of determining the affinities of metals for each other.

Chap. 4 Of Earths

Every body which possesses the following properties is an Earth.

1. Insoluble in water, or nearly so; or at least becoming insoluble when combined with carbonic acid.

2. Little or no taste or smell; or at least when combined with carbonic acid.
3. Incombustible, and incapable , while pure, of being altered by fire.
4. A specific gravity not exceeding 4.9
5. When pure capable of assuming the form of white powder.

The Earths at present known amount to eight; the names of which are

Lime,
Magnesia,
Banytes,
Strontites,
Alumina,
Silica,
Jangonia
Glucinia.

All of the above characteristics are not, perhaps, rigorously applicable to each of these bodies; but all possess a sufficient number of common properties to render it useful to arrange them under one class.

Note. Later treatises of Chemistry present principles differing from the above, and in fact the science seems to be unsettled, and varying.

10

Solar Eclipse June 16, 1806

This Eclipse was total in New England, and according to the calculation in Houghton's Almanac (fitted to the Lat. & Long. of Boston) was as follows, viz.

	H	M	
Beginning.....	9	48	Morning
Middle.....	11	22	Solar time
End.....	0	45 }	afternoon
Duration	2	57	

This eclipse, according to the Nautical Almanac, was only 3°28' Digits on the sun's south Limb, at Greenwich.

H. M. S.

It began thus 4~36~30 afternoon ~

At Deerfield the day was uncommonly clear, scarcely a cloud to be seen. The Eclipse came on agreeably to the calculations: some time before it became total the planet Venus appeared Southwesterly of the Sun. During total darkness the following stars were seen. Aldebaran appeared about 9° S.W. of the sun; several in the Constellation of

of Orion viz. those in right & left shoulder & the
belt. Syrius was very conspicuous 46°
S.E. from the sun, several others were obscured. The plan-
ets Mercury and Mars were seen west of the sun a little
more north Venus and between and between the Sun & this
planet. The air [———] changed very suddenly, the
mercury in the thermometer fell from 72° to 59° and it
was so chilly that many people put on additional clothing.
It was observed by people who were mowing that the grass
became wet with dew. Fowls returned to the roost, night-
hawks left their retirement, as at the approach of night,
& flew briskly about, and the Whippoorwill gave us his
solitary song. The darkness was so great that we could
not read without candles; a universal gloom seemed to
sit upon the face of nature. [——] Some unacquainted with
astronomy tho't the eclipse miraculous. A kind of twilight sur-
rounded the moon, and the rays of the Sun shot out from behind
Sunbody in every direction, and the appearance was similar to those represented by astronomers in
the figures of the Sun in their Books. The moon appeared like
a dark patch in the heavens. In the North and south the hori-
zon appeared lighter than in the East and west. This
~~have been caused by the~~ I alluded to 2d confirmed view east & west, owing to ~~said by~~
the

propinquity of the mountains ~~which~~. The duration of
total darkness was, as nearly as we could determine by clocks
and watches, 4 ½ minutes. When the moon left the west
circle of the sun, the darkness disappeared instantaneously
(as it does on bringing a candle suddenly into a dark room)
and the refulgent "orb of day" threw off the gloomy tho' pleasing sad-
ness in which we had been enveloped.

The following paragraph in the course of the Shadow
occasioned by the eclipse is taken from the New England
Palladium into which it was inserted from a New York
Almanac.

"The centre of the shadow enters upon the globe in the
Pacific ocean about 15° to the eastward of the Sandwich
islands Lat. 29°--25'N. Long. 65°--W. from Philadelphia, from
thence it takes a course eastward inclining to the north,
passing through new Mexico & Louisiana--crosses the Missis-
ippi about 80 miles above its confluence with the Missou-
ri, and passes on to the eastward through the state of Ohio,
the north part of Pennsylvania and a part of N York, cross-
ing Hudsons River about 40 miles to the south of Alba-
ny--enters Massachusetts about fifteen miles north
of Connecticut Line and passes through Northampton,
Worcester

Worcester and Boston. Then it takes across the Atlantic, binding its course towards the south, enters upon the continent of Africa, a little to the South of the Canary Islands, then with a S.E. course passes thro' the western part of the great desert of Barbary in the country of Nignitia where it finally leaves the globe, the sun setting controlly eclipsed Lat. 14°N. Long. 80°-39'E. Allen"

s o ' "

The sun's Longitude at the time of the eclipse was 2 _24_45_17
Declination ---- 23∘ 21' North

Observation on this eclipse were made by astronomers in various places, all of which I have received any account make the duration of total darkness nearly double to that given by calculation. Was not the Duration of the dark shadows greater than was supposed by the calculations?

11

To find the greatest Azimuth of a circumpolar star from the Meridian having the Lat. of the place and the stars polar dist. given.

Proportion.

Co.Sin.Lat.:Rad:: Stars polar dist (or 60. Decl.) : Sin. of its greatest Azimuth.

Let

Let it be required to find the greatest azimuth of the
north polar star at Deerfield Decr 14 1806.

Should be 42..32 } Lat. of Deerfield 42°26'..13 (See page 2d Journal)

Declination of the star for beginning 1800= 88°14'N. (See Bowditch Table)

Add annual variation for 6 years =	0-1.57,6
True Declination	88.15-57,6
Subtract from	90
Gives Polar Distance =	1.44:02.4
	Logarithm
Co. Sin. Lat 42°.26'	9.86809
:Radius	10.00000
::‡Polar Dist - 1°-44' (Sine)	8,48069
	18.48069
	9.868809
:Sin greatest azimuth 2°.21' =	8.61260

To find the time when this star has its greatest azimuth
Suns Rt. Ascension Decr. 14 1806 at Greenwich at noon $17^{H}\ 24^{M}\ 40.5^{S}$
Under the daily variation of suns R.A. & against
Long. 72-33 in Bowditch's 29^{th} Table is 54 seconds for additions } =54
Sum R.A. at noon at Deerfield 17:25-34,5

	H M S
Stars Rt. Ascension (Table 11 Bowditch)	0.. 52..15
Annual var. 12.5^{s} X $6^{years} = 1^{m}\ 15^{s}$ add	1 15
Stars Rt Asscension 1806	0..53..30
Add 24 Hours (Star R.A. being less than Suns)	24
	24..53..30
Subtract Suns Rt Ascension	17..25.34,5
The Star will come upon the meridian above pole	7..27..55,5 evening
This star makes an apparent revolution round the Pole in 23^{H}—56^{M} (nearly) consequently ¼ of Revolution in	5.59 to be added
Greatest Enongation west of Meridian at	13.26-55,5 on

$1^{H}..26^{M}..555^{S}$ after midnight. Hence it appears that the North Pole star will bear N 2°..21’ 10 from the time meridian at $1^{H}..26^{M}..55,5^{S}$ on the night of the 14 Decr 1806 at which time it will be at the west end of the horizontal diameter of its diurnal Circle; but refraction will cause it to appear about one minute higher. Note the Lat. used is to small should be 42°..32’..32”

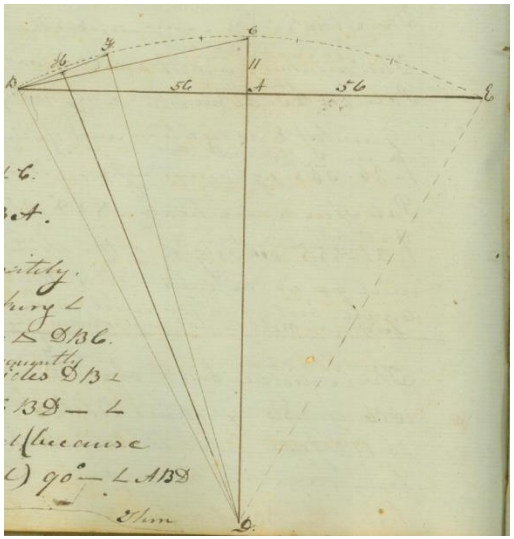
12

The Bridge built over Deerfield River at Cheapside, in 1806, consists of three Arches of a circle; the chord of each is 112 feet and the versed sine 11 feet; when the tim ber was preparing the Engineer requested me to give him the ∟s of a piece of timber which should constitute one

<u>one fifth</u> of one of these arches. The process to find this is as follows.

Make a Rightangled Triangle ABC; the base AB=56= half the chord of the Arch; AC=11=∟s of the arch and BAC the right angle.

In the ΔABC there are two sides given to find ∟C; thus AC: Rad.:: AB: Tang. ∟C and 90°-∟C= ∟C/3A Prolong CA indefinitely and draw BD, making ∟ CBD=∟BCD. In Δ DBC ∟C=∟CBD, and consequently side DB & DC equal‡. Hence ∟CBD-∟ CBA=∟ABD, and (because ΔDAB is rightangled) 90°-∟ABD =∟ADB



Then

‡Euchid Lib 1, prop 5.

Then to find DA the proportion is Rad : BA :: Tang. ∟ABD : AD. and AD + AC = DC the Radius of the Circle of which the arch is a portion.

The ∟BDC (=1/2 arch) X 2= arch BCC : and $\frac{BCE}{5} = \frac{1}{5}$ of arch BCE. From B set of $\frac{1}{5}$ of the arch BF; draw the chord BF; bisects BF in H and draw DH & DF, then ∟BDF = $\frac{1}{5}$ of the arch; and ∟BDH is given (= ½ BDF) and 90°- ∟BDH = ∟ DBH.

To find DH it will be Rad. : DB :: Sin. DBH : DH. Then DB (=DC) – DH = the ∟s of $\frac{1}{5}$ of the Arch which was required~

The calculation by Logarithms is as follows.

AC 11	1,04139		
: Rad.	10,00000		
::BA 56	1,74818		
	11 74818		
	-104139		
: Tang ∟C =	10.70679	=	78° 53’
			-11 07=∟CBA
			-67 46=∟ABD.
			90
			22 14=∟BDA

To find

To find DA Rad. 10,00000
: AB --56-- 1,74818
:: Tang ABD=6746= 10,38852
:DA=137 = ~~1~~2,13670

AC= 11
DA= 137

148= Radius of the Circle of which the arch is a portion
ADB= 22°..14' X 2 = 44°..28' = Arch BCE.
5) 44°- 28' (8°..53'..36" = ∟BDF
-4-26-48 = ½ ∟BDF = BDH.
90
85 33 12 = ∟DBH

To find DH

Rad.	10,00000	DC=148 feet
:DB=1776 when=	3,24944	x 12 inches
::Sin DBH=85..33=	9,99869	1776 inches in 148 feet
:DH = 1770=	3,24813	DH=1770
		∟s 6 inches

Here it appears that the ∟s of $\frac{1}{5}$ of the arch 6 inches : or
losely calculated it will be found a little less viz 5,36 inches

13

Thermometers.

Thermometers may be reduced to the corresponding degrees of any of the others, by means of the following simple canons~

1 To convert the degrees of Reaumur into those of Fahrenheit.

$\frac{Rx9}{4} + 32 = F$

2. To convert the degrees of Fahrenheit into those of Reaumur

$\frac{F-32x4}{9} = R$

3. To convert the Sweedish degrees into those of Fahrenheit.

$\frac{Sx9}{5} + 32 = F$. And $\frac{F-32x5}{9} = S$.

Note. R=degrees of Reaumur, F those of Fahrenheit, and S those of the Swedish thermometer, in the above canons~

Lavoiscer Elements of Chemistry, quoted in Ency. Art. thermometer Also [ ] N 4 in Lavoiscer.

Note Fahrenheit numbers 212°, from freezing to boiling point of water; Reaumur 80° from freezing to boiling point; and Sweedish from ~~from~~ freezing to boiling point, 100° Fahrenheit generally used in this Country.

14.

On the Winters of New England, compared with other Countries

The winter of 1806-7, throughout Canada & the Northern parts of the United States has been remarkably cold and except in the most elevated parts. very little snow has fallen: the quantity at Deerfield did not exceed inches, after the winter set in; if we add ti this 6 inches, the depth of a sudden fall of snow on the 30th of October, which very soon melted the whole amount will be inches. which is inches less than the quantity which fell last winter. On the Green mountains, between Wilmington and Bennington, the fore part of March, I found the snow 3 feet deep while at Bennington there was not a sufficiency for sleighing, the Roads being for the most part bare. Bennington is situated in a valley at the west side of the aforementioned mountain and within about a mile of it, the difference of the temperature of the air in this valley and that of Mountain is very striking. In the latter part of winter when the weather becomes so warm as to melt the snow & uncover the ground and spring seems to be ushering in, the

mountain

mountain has the dreary aspect of January -- the air is keen,
and the traveller who departs from Bennington comfortably
cloathed, finds it necessary to put on additional cloathing to
avoid the frost. This weather frequently continues on the moun-
tain till vegetation is considerably advanced at Bennington.
Governor Tichinor informed me he had seen Peach trees in
full bloom at the latter place when the mountain was
covered with snow several feet deep and everything
firmly congealed as in the midst of winter. This difference in the state
of the air at Bennington and on the mountains, is the cause of
sudden and strong gusts of N E wind from the latter: these
are sometimes so violent as to ? buildings; and the
farmers at Bennington ----------, in order to avoid this,
in erecting their Hovels or Cowhouses, find it necessary to place
them with the open sides to the west. At Deerfield we experi-
ence none of these gusts; our most violent ones are from the
westerly quarter~In the [ ] at Deerfield we generally have more snow
than in the country west of the mountain: this must be
owing to other causes than elevation above the ocean, for
the difference in this cannot be great. Perhaps it is owing to the
calcareous nature of the soil at Bennington & the Regions near
the mountain north & south of that place which abound
in Limestone. This increase on the quantity of snow in the
parts contiguous to the Hudson, which must be less elevated then,
Bennington & other places near the mountain, render this con-
jecture probable~. But, to return from the Digression

In the month of February we had several rains which

which produced violent freshets and broke up the River,
and great damage was sustained by the enormous quantities
of ice brot down; Mills, Dams, & Bridges were swept
off in all parts of New England, particularly in Connecticut.
It is not recollected that the destruction of property in one winter
has equaled this since the settlement of the Country. Before
these rains the springs were very low, and it was extreme-
ly difficult for the farmers to find water for their cattle.
The small rains which fall in the forepart of winter mixed
with the snow and soon congealed into a solid mass of ice; this con-
tinued on the ground through the winter and was one cause
of the freshets, for it prevented the rains from penetrating the ground
in any considerable quantity, and facilitated the descent of the
water into the Rivers.

The following exhibits the Days of continued frost

December	13
January	18
February	8
March	3
Total	42

We have several extremely cold Days. The 26th January
was, perhaps as cold a day as has been known in this
Latitude. At sunrise the mercury was 10 below Zero;
at 2 oclock PM 3 above, and 10 in the morning 14
below. The weather became more more moderate in
the

the night, and sun rise next morning the mercury
stood at 6 ∘ below zero. The day throughout was very clear, and
almost calm; the sun shone with full lustre, but it
had very little effect on the frost even on the south
of buildings, or where the sun's rays fell perpendicularly.
The day following was very cold; the mercury stood at
10∘ above at 2 o'clock PM. but the day was cloudy and a
little snow fell.

Observations on this Day (26) were made in various parts
of N England the following I have collected from various
sources

Cambridge ‡	0 / 13	The observations marked thus # are
Hallowell (Me)+	0 / 33	taken from Doct Adams Register
Portsmouth¤	0 / 9	and were made at sun rise, as
Boston¤	0 / 4	was that at Deerfield. Those made
Smithfield, R.I.¤	0 / 12	at Cambridge & Hallowell it
Hartford¤	0 / 6	is presumed were made at the
Warwick¤	0 / 15	same time, though the time
Deerfield	0 / 10	of Day was not mentioned.

By comparing the above observations it appears that the
weather differs considerably in different places. Some allow-
ance undoubtedly ought to be made for the difference of
the thermometers and for the manner in which they were
exposed

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‡Central. + Chronicle . ¤Adams Register

exposed. But these allowances will not be sufficient to reduce the observations to the same temperature. Hence it is evident that places situated at no very great distance from each other differ essentially in their temperatures. (It is found that the temperature of a county is not regulated wholly by its Latitude, but by other circumstances; such as its height above the level of the Ocean; its vicinity to large tracts of uncultivated land, Lakes seas, or marshes--the position and height of its mountains; the direction of its winds, and the quantity of evaporation from its surface and probably many other causes unknown.)

About the last of February one of my neighbours found it necessary to repair his aquaduct which conveyed water to his barn for this purpose it was necessary to dig through the frost; I [ ] the oportunity to measure the depth and found it 3 feet in level loamy Land. We are informed that the frost does not penetrate the Earth at Petersburgh in Russia to a much greater depth than this.‡

The ice brot down our River was of an unusual thickness. I measured a block which was 2 feet 9 inches thick: this was very regular & solid: the two surfaces ? plain & parallel; but in general it did not exceed 20 inches.

The

‡Tookes, Catherine vol. 1 page 8 Dublin 1800

The lowest descent of the mercury observed at Deerfield this year was in the evening of the 26 Jany and the morning of the 9th of February when it stood 14 below Zero. The mercury has frequently descended lower than this ~~(in the morning~~ January 16, 1805 at sun rise the mercury was $\frac{0}{18}$ Jany 18, 1806 it was $\frac{0}{23}$ in the shade for some time after ~~the~~ sun rise. If the observation made at Hallowell as before mentioned be correct (33°) the mercury was but ~~little~~ a few degrees above the point of congelation which is fixed at 40 below zero. This is ~~the utmost extent~~ said to be the "ultimate degree of cold which the mercurial thermometer will measure." The mercury will descend lower ~~(than this)~~ but it falls suddenly & by starts 100° at a time - (see Dr Blacks experiments, mentioned Encyclopedia Vol. 5 Art. Cold) By the observations of Mr Fowler made at Windsor Vt ‡ it appears that the mercury stood 24 below zero at sun rise on the 18 Jany 1806. This is one degree lower than it was at Deerfield the same time. At Frederic Town on the River St John in New Brunswick I was informed by a gentleman belonging to the Engineers, that mercury had been known to congeal at that place. Frederictown is about Latitude & is situated on the West bank of the River on a plain but a few feet above the level of the Bay of Fundy. At Rutland Vt. at the foot of th

‡See Adams Register N. 14

of the green mountain Dr. Williams has observed the mercury at $\frac{0}{27}$. At Albany on 9th February this year the thermometer was $\frac{0}{20}$ Seventeen years ago says my informant it fell 4° lower.

From the foregoing statement it appears that the Winters of New England and the adjacent parts [—] are extremely cold; and on comparing these with observations made in Europe we ~~shall~~ find that our winters are colder than those of corresponding Latitudes in Europe & even much higher Latitudes and indeed very little short of those of Russia.

The greatest degree of cold since the building of the City of Petersburg was by Reaumur 32 1/2, the 6th of Janry 1760 and again in January 1799‡.

The average cold in the following Months is deduced from observations made at the Imperial Academy of Science at Petersburg viz.

	Reaumur		Farh
November	$\frac{o}{11}$	=	
December	$\frac{0}{10}$	=	
January	$\frac{0}{22}$	=	
February	$\frac{0}{19\ 1/2}$	=	
March	14	=	

‡Tooks, Catherine

At London, England, Lat. 51°32', in the winter of 1801-2 the highest and lowest range of the Thermometer was as follows

	[lowest]	highest
November		
December		
January	17	47
February	31	49
March	35	53

In the winter of 1803-4 it was as follows

	lowest	highest
November		
December	21	54
January	30	51
February	26	40
March	27	51

In the winter of 1804-5 it was as follows

November		
December		
January	28	40
February	23	47
March	34	50

For Continuation See page --

15

And easy Rule for finding the equation for the change of the sun's declination when equal altitudes are used to regulate a clock or other time keeper. By Andrew Ellicott Esq. From the Philosophical Transaction Vol. 6 page 26 (N. 4)

For the First Part

Find the Sun's Long declination, and the change of declination for 24h at the time of the observation, likewise find the proportional part of the change of declination for the half interval between the forenoon and afternoon observation, then take the proportional Log. answering to the change of declination for the half interval (increasing the interval by 10) from which take the Log. cosecant of the horary angle; to the remainder add the Log. cotangent of the Lat. of the place of observation, and take out the minute and second from the P. Ls. answering to the sum (10 being deducted from the incline) which converted into time will give the first part of the correction and will be deductive, in north Latitude, when the suns Long. is 0.1.2,9-10 or 11 signs, and addative in the others; but the contrary in South Latitudes.

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For the Second Part

To the P.L. of the change of the suns declination during the

the half interval add the Log. cotangent of the suns declination, from that sum deduct the Log. cotangent of the horary angle. --Take out the minute and second from P.Ls. answering to the remainder, which will give those ??of the correction; this is common to all Latitudes, and will be addative when the suns Long. is 0.1.2.6.7. or 8 signs and deductive in the others.

==========

Example

Suppose, the following equal atts. were taken in Lat. 39°56' N. when the Suns Long. was 4s 15°

	h.	'	"
A.M. 8h 32' 20"	3---	32	24
Adel	12	0	0
	15 ---	32 ---	24
Deduct forenoon observation	8 ----	32 ----	20
2)	7 ---	00 ---	04
half interval ----------	3 ----	30 ----	02
Add forenoon observation ---	8 ----	32 ----	20
Suns centre on the meridian nearly	12 ---	02---	22

==========

For the Correction

The suns declination answering to 4s 15° of his Long. is nearly 16° 21' and the change of declination at the same time about 16'55" in 24 hours; 2' 28 during the half interval. The

Then by the Rule

Change of declination during
half interval 2' 28" P.L. 11,8631. +10
Horary angle 52°-30' Log. cosec. --- 10,1005
1,7626

Latitude 39°-56' Log. co.tan + ------ 10,0772
P.L 1,8398 = 2' -36"=

10"- 24"' in time, being the first part of the equation,
and addative, by the rule.

For the Second part

Change of declination during the
half interval 2'-28" P.L.---------- 1.8631
Suns declination 16°21' log.co. tang. +10.5326
12.3957
Horary angle 52'30" log.co. tang.---- 9.8850
P.L. 2.5107 = 0'-33"=

2"-12"' in time, being the second part of the equation, and
deductive by the rule.

Application

Apparent time of the suns centre on the meridian 12h.2'.22".'" 0 by alt
First part of the Equation + 10".24"
Second do---------- 2.12 + 8-12
Suns centre on the meridian 12.2 30-12

16

Improved method of projecting & measuring plane angles by Robert Patterson. From the Philosophical Transactions Vol 6 page 29 Art. 6.

"The Rad. of a circle of which the chord of any given arch shall contain just as many equal parts of the radius as the arch contains degrees, is easily calculated, The one I have chosen is third of a circle of which the chord is of an arch of 25 degrees shall equal 25 parts. This Rad. is 57 ¾ very nearly. Now it will be found that of this circle the chord of any arch under 30 degrees will never vary more than 1/12 part of an unit from the number of degrees in that arch. Hence to lay down any angle of any given number of degrees and parts you have only to take with a pair of compasses, from any line of equal parts, 57 3/4 and with this Rad. describing an arch ~~under & a degree~~ apply thereon from the same scale (or line) the chord of the angles required, if not exceeding 30 degrees; (calling each part or ~~line~~ equal [ ] of the line a degree) and the two radii drawn from the center to the points of application on the arch, will contain the angle required. If the given angle required exceeds 30°, first apply the radius (which equals the chord of 60°) and then taking from the line of equal parts the chord of the difference between 60° and the given angle, apply it on the circle from 60

either

either forwards or backwards, according as the given angle is greater of less than 60 degrees.

The measuring of an angle being only the reverse of the form will consist in describing an arch round the angular point, as a as a centre with a rad. = 57 3/4 and then applying the chord of this arch comprehended between the two lines, including the angle if not exceeding 30° you must first apply the radius, and then measure the arch of excess or defect above or below 60 as above.

Though the above method of projecting & measuring angles will never be liable to an error of more than five or six minutes of a degree, which in practice may be safely neglected, yet even these small errors may, when thought necessary, be allowed for as follows--

From 6 degrees to 21
From 28--------to 30 } call the ∠ 5 minutes { more / less } than

it measures and if this allowance be made the error will scarce even exceed one minute.

The diagonal scale of 20 parts to an inch will be of a a very convenient size for the above purpose. On this the half inch is divided into 100=parts, each of which will correspond to 6 minutes.

17

1811 } Perambulation of an old Line
March 27 } This day, with my [ ] or Hanks compass, perambulated the divisional line between the first and second Division of inner commons in Deerfield. Began at old marks upon trees in the fence between the Land of Orlando Ware and Jonathan Hoit 2d (Mr Ware's lot is N. in 2d Division) on run S. 16 ° W by Needle marked trees were found in my course west of Roswell Lanfair's land; and a large white oak , now hollow, with an old mark upon each side, about 20 Rods north of the road leading to Shelburne was found to be exactly in my line. Continuing through the cleared Land to the Woods South of Mr. Paul Hawks pasture trees marked were found near my course. At the Road leading to my Still water pasture I struck exactly a large while oak, with ancient marks; continuing to the river, found, very near my line, several piles of stones which seemed to be ancient corners. On the rocks near the river, at the end of my course, made a pile of stones, and marked, with my pocket knife, a white oak tree with a spot or blaze~ D:Line on the NW side. This oak is about 8 feet SE of the pile of stones.
Note. The above is the westernmost line called the Division Line. The Flower de Lis N. & N. and Needle for course

18

Course of the lines of the lots in the 2d Division of lots (inner commons) near Mr. Zed Hawks as run April 9_1811.
W 2°_30' S. This coincided with the lines of Frederick Boyden's lot. A lot further north, ran for Israel Childs, is W 2°.40'S.
The division line East of Boyden Lane was N3°W.

19

August 1811. Perambulated the Division Line between the 1st & 2d Division of innr commons, from a corner of a lot North of Mr. Jones to the NW ∠ of Jonathan Hoyt's 3° Land; found the course S16 W (needle) Exactly coinciding with the line further South, see p. 73.

July 17, 1815 Perambulated the Division line between 1st & 2d Division of inner commons from SW ∠ Phillips lot to the walnut in said line north of Nathan Robbins Barn. Course N°16"E; fell about one Rod west of of walnut (my Hawks compass N and needle, flower de Lis North)
By calculation the true course is N16°10'40"E –
Hence the course of the Line of the lot (being at ∟s with the Division Line is E 16°10'40"S by the needle of said compass.
Note. The survey was made with the same compass mentioned page 73 but with a new needle. Line run near noon.

1811 20

Literary ~~and Philosophical~~ Intelligence

1. M. & W. Ward N. 4 City Hotel Broadway, N York advertise "Art of War including the duty of officers in actual service and the principles of Modern Tactics. Illustrated with numerous plates (Oct 26_ 1809) 4 vols 8vo

2. Wm Wells Boston. Officers manual in the Field with many plates. Strumzee's Field Fortification 1 Vol.—Warnery's Remarks on Cavarly 1 Vol. – Vince's Practical Astrology –Mackay on on Longitude 2 Vol.—Mackays Complete collection of mathematical Tables 1 Vol.—Davis, Complete Treatise of Land Surveying 1 vol. Hutton's mathematical Tables 1 vol. – Nicholson's Journal of Natural Philosophy 1 Vol. –

3. European Magazin 1805 (Novr) Reviews Military Memoirs relating to campaigns, battles & stratagems of wars, ancient and modern: Extracted from the best authorities, with occasional remarks. By William Thompson, L.L.D. Second Edition revised and enlarged by James Glenie Esq. F.R.S. (London & Edinburgh) and formerly an officer in his Majesty's Corps of Engineers. 1 Vol 8vo pp. 642. (1805).

A good work

Highly approved by the Reviewers.

Literary and Philosophical Intelligence

4. Edward Parker & Joseph Delaplaine N. 466 (north second street) ~~New York~~ Philadelphia have published Prospectus of the Edinburgh Encyclopaedia conducted by David Brewster L.L.D. &c. with the assistance of a large number of English gentlemen, distinguished in science and Literature. A considerable number of American Gentlemen of Science and Literature have offered their assistance to the Editors. The works will be comprised in 12 Vols. 4 to to contain between 800 & 900 pages each; with plates executed in a superior manner, by the finest artists in this country. A half vol. to be published every three months beginning Jany 1—1812. Price to subscribers 4 dollars for each half vol.

5. Bronson's Select Reviews for June 1809 announces Essays on the theory and practice of the Art of War, including the duties of officers in actual service, and the principles of modern Tactics. Chiefly translated from the best French & German writers. By the editor of the military mentor. In 3 handsome Vols. with numerous engravings. English price £1.16 in Boards.

Literary Intelligence &c

6. Robert M. Dermut, New York. proposes to publish by Subscription The History and practice of finding the Longitude at Sea or Land; to which are added various methods of determining the Latitude of a place, and the variation of the Compass: with new Tables. By Andrew Mackay LLD. FRS. In 2 Vol 8vo improved and enlarged (April 1809 Brown) Price to subscribers , in plain binding 7 dollars.
NB: The 3d Edition of this work is announced in an English Catalogue, with improvements, &c at £2_12_6 Sterling.

Novr 1, 1809

7. Kimber & Conrad N. 93 Market Street Philadelphia , have issued proposals for publishing by subscription A General Collection of Voyages and Travels: Forming a complete history of the origin and progress of discovery, by sea and land, from the earliest ages to the present time. Preceded by an historical and critical catalogue of books of voyages and travels; and illustrated and adorned with numerous engravings. By John Pinkerton, author of the modern Geography. The work to be comprised in 10 or 12 vol4 to. between 800 & 900 pages each Price to subscribers 8 dollars the Vol.

Literary Intelligence &c

Der 26 1809

8. E. & F. Backus N. 45 State Street Albany offer for sale Arrowsmiths New and Elegant General Atlas, comprising all the discoveries to the present time (63 maps) 4to

9. Inskeep and Bradford, N 128 Broadway, New York advertise the following military Books. viz

April 1810

Practical observations on the Errors committed by Generals & Field officers, commanding armies & detachments, interspersed with various instances of Judicious disposition, and gallant atchievment, from the year 1743 to the present time: to which is added a new system of fortification, with plates. By William Armstrong adjutant General of the English forces.

Remarks on Cavalry, by the Prussian General of Hussars Warnery, with numerous plates 1vol 4to

Cunningham's Tactics of the British Army, with reflections on the science and principles of war, uniting

Literary Intelligence &c

in one view, the evolution of the Battalion, brigade,& line,
and pointing out their combinations with each other,
and uses in actual service.

Luffman's Select plans of the principle cities, har-
bors, forts &c in the world

Intructions and regulations for the formation and
movement of Cavalry, iVol.

Hutton's Course of Mathematics 2 Vol 8vo

Jones Artificial Fire works for Sea and Land Service

Robbin'ss Principles of Germany---

The Spirit of the Modern System of War, by a Prus-
sian General Officer: with a Commentary by C M de Martemont
Captain in the French Artillery 1 Vol 8vo
Haly's Military Observations, with plates
Tytler's military Law + Practice of Courts Martial
M'Arthur's principles & practice of Naval & military Courts martial
2 vol 8vo

Literary Intelligence &c

Manoeuvres of the Horse Artillery by General Kosiusko 1 vol

Muller's Fortification, regular & irregular. (4 vol 8vo)

Practical Geometry, for the use of Military Schools

Memoir of the Medical Arrangements necessary to be observed in Camps.

James' Regimental Companion, containing the relative duties of every officer in the Army, 2 vol. or 4 vol.

General Orders, and observations on the field exercise of Infantry.

Instruction for Hussars and Light Cavalry in time of war. 1 Vol.

The duty of Infantry Officers in Camp, garrison & shipboard &c &c By Thomas Reade.

Jerry's Duties of Light Infantry in the field.

Herrie's Instructions for Volunteer Corps of Cavalry

Russell's Instructions for the Drill, and of performing the eighteen manoeuvres, 1 Vol, 8vo

Literary Intelligence &c

The defense of Pickets relative to the service in the Field

Treatise on reconnoitering

Simes' Military instructor for non commissioned officers & soldiers

The Brigade Majors Assistant, containing orders, rules and regulations for the guidance and discharge of the duties of that Station.

The Duties of Etats Majors in the French army.

April 1810 } 10—M & W Ward New York offer for sale The Regimental Companion, containing the relative duties of every officer in the army 2 Vol. & Supplment ! Vol

Whitman's General System of Tactics and military arrangement, with observations on the practice of Light Infantry, Field Fortification and the Petite Guerres 1Vol.

Hints for Non commissioned officers 1 Vol.

A treatise upon the Duty of Light troops by Col Von Ehwald 1 Vol

Literary Intelligence &c

A Treatise on Military Finance 2Vol.

A Military Chatechism for Young Officers

11 Works found in various Catalogues of late date viz.

Observations on the Exercise of Riflemen & movements of Light troops in general, by Sergeant Wedderburne 1 Vol.

Landman's Field Engineer's Vademecum I Vol. (7/English

The Experienced Officer; or Instructions by Genl Frances Wimpffen I Vol. (5/ English)

The first Principles of Field Fortification. By Wm Nicolay

Aldington's Essay on the Construction of Light artillery for acting with Infantry, and a description of the loaded spear, recommended for the rear Rank.

Guberts military works ---------- or Essays 2 Vol.

The British Military Library with about 100 plates 2 Vol. 4to. from £4-14 to £5-15 English a superior & useful work.

Literary Intelligence &c

The Field of Mars being an alphabetical digestion of the principal naval and military Engagements in Europe, Asia, Africa and America. Particularly of Great Britain and her allies, from the 9th Century to the peace of 1801. Consisting of

Actions	Descents	Sea Fights
Attacks	Defeats	Storms
Attempts	Engagements	Sieges
Battles	Expeditions	Repulses and
Blockades	Invasions	Skirmishes
Bombardments	Reductions	

Selected from the best Historians and journalists and adjusted from the greatest authorities. Interspersed with concise descriptions of the Towns and places, the subject of each action. 2 Vol. 4to.
Price at Boston $16.67~

Practical System of the Art of War; translated from the German of G Verturini 4 Vol 4to. illustrated with numerous Plans. This work is recommended in the strongest terms by the King of Prussia, Arch Duke Charles & others. Was to be published in London in 1800.

Literary Intelligence &c

Epitome of military Events with maps & plates translates
from the French original printed at Hamburgh 2 Vol. in one

Vegetius ancient art of war translated by Capt Clarke 1 Vol.
Marshal Peysegers art of War (old)

Memoirs of the Marquis Feuquieres 2 Vol.
Military memoirs, by Ch. Ginischart.
Do Do of the Duke of Berwick 2 Vol } old works

NB. For a further list of military Books reference may
be had to T. Egerton's Catalogue military Library
Whitehall London

12 J Riley (New York) has just published "Travels on an
inland voyage through the states of New York, Pennsylvania,
Virginia, Ohio, Kentucky and Tennessee, and through
the territories of Indiana, Louisiana, Mississippi and
New Orleans; performed in the years 1807 & 1808.
By C Schultz Jr Esq. with maps & plates. 2 Vol

This

Literary Intelligence &c

This work is said to be a valuable acquisition to our Libraries. The style is free and easy, the philosophical deduction forcibly illustrated, and the whole interspersed with a fund of most useful information and original anecdote. The work is illustrated with four large and valuable maps, and embellished with some interesting drawings; and contains the best descriptions of the fall of Niagara, and the ancient Fortifications, at Marietta, that have been published.

13 Messrs Wait & Co. Boston, have in the press Bigelow's view of the world. 5 Vol. 8 vo, price $2.25 per Vol. The works commenced in June 1811, one Vol to be published each month till the whole are completed. This work improved and corrected, so far as respects America, by Doct Morse~

14 Bradford and Inskeep Philadelphia, have issued proposals for publishing by subscription Memoirs
Sept. 1 of the War in the Southern Department of the
1811 United States. By Henry Lee Lt Col of the Partizan Legion during the American War. 2 Vol 8vo about 300

pages each. Price to subscribers 3 dollars a Volume.
The work is to be printed on the best paper, and with
the neatest type; each Vol imbellished with heads and
maps. The form of this work has enabled the author
to enter into a more minute narrative than is admissa-
ble in general history, and to bring into view a greater
number of meritorious actors, who, though in subordinate
stations displayed a zeal, fidelity, and skill, which ought
forever to imbalm their names in the memory of a
free and grateful people. The style is clear and
comprehensive, and the narrative interspersed with in-
teresting anecdotes and moral, ~~and~~ political, and military
reflections naturally springing from and appositely
combined with the subject. On the whole the publishers
do not hesitate to say, that the patriot will be delighted,
the statesman informed, and the soldier instructed by
the ingenious stamp of a Patriot Soldier, and cannot
fail to interest all who desire to understand the causes,
and to know the difficulties of our memorable struggle.
These facts may be relied on; " all of which he saw,
and part of which he was" ~

Literary Intelligence &c

15 Prospectus (by Ezra Sargeant New York) of a New periodical work to be intitled Medical & Philosophical Register, or Annals of Medicine, natural History agriculture and the Arts. Conducted by a Society of Gentlemen.

The work will be divided in three parts. 1st original communication embracing the various subjects of medicine, chemistry, agriculture, natural history, botany. and the useful arts: Medical Topography, antiquities of the american continent, articles of American biography &c.

2d Review of new publications, in the several depart-ments off medical science: Transactions of our learned Societies &c.

3. Philosophical & Literary Intelligence: under which head will be included, as far as practicable, whatever is interesting to the physician, naturalist, agricultur-alist, and philosopher. Accounts of Literary and human operations, proceedings of learned societies; reports of public hospitals, notices of new publications &c. The work will appear once in 3 months occasion-ally enriched with engravings. Each number to contain 100 pages 8vo forming a Vol of 400 pages ~ Price 2 Dol per Annum

June 14 1810

Astronomical Observations

21 (16) September 7th 1811 about 8 o'clock in the evening, a comet was seen in the northwest part of the heavens, about an hour high, near the Constellation Leo minor, as nearly as could be determined without a celestial Globe. The tail & coma large & bright, the nucleus hardly perceptible to the naked eye. It had been observed by some people in this village the two preceding evenings, and from their accounts of its place and its change since it ~~does not appear to be approaching its perihelion~~ it appears to recede from its perihelion.

8th Evening cloudy, excepting near the horizon, which prevents our observing the comet

9th Clear . At 8 h 18m PM Comets azimuth 36°-30' NW altitude 7°-27' Sky a little hazy- tail indistinct. Refraction by Table 13 in Bowditch 6' – 54"- which subtracted from the altitude 7°-29' gives 7°-46"~06 the true alt.

10th Clear evening. 7h 46th azimuth 40°-30' NW alt. 10°-46 at 8h-22m az .35°-15'. alt 6°- 45.- Distance of Comet from Alioth at 8h -15m-15'"- is 19°-20 Error of Sextant 2'-52"' Addative. At 8h-29.55 from Comet 45°-15'-30"'~ at 8 h-50-30 a Aquila's alt. 55°-32'

(NB Clock by Solar time)

17 ~~Literary & Philosophical Intelligence~~
Astronomical Observation

Sept 11 & 12 Cloudy weather and consequently no observations on the Comet.

13th Fair. Observations

P.M. At 7^H-53^m- 15^s (~~P.M.~~) Comet's Azimuth 39°-30'-00" NW Alt. 10°-57'-00"

8—58—13	Do	30-00-00	NW alt. 5.00-00
8—04—27	Comets distance from last -- 1 in Tail Ur. Maj. or northerly	22—48—30	
8—11—20	Do from Arcturus do	42—40—00	
8—16—15	last in tail U Maj below	25—15—30	Distances without
8—20—50	north pointer, below	19—15—30	correction for index
8—26—54	Alioth northerly	19—18—30	error
9—59—20	Alt. a Lyrae (by a double alt)	58—15—45	Index error
10—08—05	Do Do Do	56—45—45	by sun's diameter
10—16—10	Do a Aquilae Do	47—52—15	2"-15"+

14th Clear Observations

AM at	4—41—20 (~~A.M~~)	Comets azimuth	46—00—00	NE Alt. 17°--15'
	4—51—20	Comet from Jupiter north	63—40—00	
P.M.	7—36—50	from alioth, below	18—45—00	
	7—41—10	from arcturus, northly	41—58—30	
	7—45—30	from North pointer	18—48—00	Distances of stars
	7—50—17	from last in Tail U Maj	24—26—30	& planets without
	8—00—42	from‡ A near, Comet, South	3—36—30	correction for
	8—15—31	from last -1 in Tail U Maj	21—21—30	index error
	8—42—00	from Pole Star, westerly	47—29—30	
	7—31—10	Comets azimuth NW	42—45—00	Alt. 15°..15'
	8—39—51	Do NW	33—00—00	Alt. 7—27
	9—03—20	Alt. a Aquelae by double alt.	54—36—15	Index error
	9—12—14	Do by double alt.	54—03—30	2'

NB. The azimuths corrected for variation (5°-30W) Time apparent
by Watch (gaining)

Astronomical ~~Literary~~ & Philosophical Intelligence

15th September Clear day: flying clouds in morn.

Took equal altitudes of sun with Theodolite furnished with smoaked glass

Morning		Afternoon	
8h-43—44	Alt. 30°--03’	3h-28—57	
8—56—02	Alt. 32—12	3—15—40	Suns lower
9—06—33	Alt 33—51	3—04—47	limb

3—28—57 Suns magnetic Azimuth 69° SW
Do alt 30°--03’ Suns lower limb
Do Semi Diam. + 15.56
Apparent Alt. of ant. 30—18—56
Refraction 1.—37
True Alt 30—17—19
} Suns Declination from Tables for the time at Deerfield 3°--11’ N

Operation for variation

Co Lat 47° 32’. Co Sec. 0.13213
Co. Alt 59—43 Co Sec. 0.06371
} Rejecting 1st pg of index
Pol. Dist. 86—49
2) 194—04 sum
½ Sum 97.02 Sine 9.995790
Pol Dist 86—49
Remainder 10—13 Sine 9.24888
Sum 19.44032
Log Co Sine 58—20 (1/2 Sum) 9.72026
x2
True az from 116.40 north
Mag. Do from 111.00 Do
variation west 5.40
} Variations applyed to Comet, azimuth in preceding pages 5°-30’
5-40
Diff. 0.10

Astronomical ~~Literary &~~ Philosophical Intelligence

16th Took Equal Altitudes of Sun with Theodolite as follows

	H morn		even	
	8.48.45	Alt. 32°.03’	3-05-59	few clouds obscured the sun
	8.55.02	Do. 33.00	2.58.50	By watch which was at 8 ock AM
	8.58.11	Do. 33.00	2.58.55	put 10” back
	9.01.15	Do 34.00	2.52.15	Lower limb of Sun
	9.09.40	Do 35.00	2.46.06	Magnetic Azimuth 46—45
	9.14.50	Do 36.00	2.39.30	SE alt. 37°~
At	7.15.20	Comets azimuth	43°-45’ alt. 17°-20’	
PM	7.43.30	Do from alioth	16.35	Index error
	7.59.35	Do from North point	18.48	
	8.07.00	Do from N. Star	46.23.30	
	8.28.00	Do Arcturus (northerly)	40.22.30	Tail measured this
	8.38.45	Do a Lyrae Do	72.22.00	night C Degree
	8.51.00	Do last T. U Maj:	19.48.00	

17 September very fair and clear through the Day.

Equal altitudes with Sextant.

	morn		evening	afternoon	
	8-50-17	Alt. (double)	63°056’	3.04-20	By Capt Wells’
	8-52-36	Do	64.42	3.01-43	Clock with
	8-55-14	Do	65-32.30	2.59.05	Second hand
	8.57.36	Do	66-12.30	2.56.47	
Theodolite	9.07.39	Alt. (Single)	35.33.00	2.40-14 by watch (doubtful)	

This day Sun eclipsed and by observation as follows

Astronomical & Philosophical Intelligence

Sept. 17.

	h m s	
Beginning of Eclipse	0—43—04 PM	by Clock
End of Do	3—47—59	
Do of Do ~~by watch~~	3—46—33 by watch	

H m s

(At 1. 45 34 distance of cusps 80 Divisions of micrometer)
Suns Diameter, in Divisions of the micrometer, 90. Suns Diam
eter in seconds 32 in minutes of a degree (nearly) Therefore 90:32::1:21 1/3= 1 division of micrometer
Breadth of enlightened part (not covered by moon) at the greatest
observation, 10 Divisions of micrometer. Hence 90:12::10:1 1/3
And 12---1 1/3 the digits elipsed by observation
Telescope used in observing the elipse, a 2 ½ feet achrometer
refractor; made by Jones London.
The equal altitudes were taken with a best metal
Sextant, 10 inch radius, divided by nonius to 30 seconds.
Also made by Jones. Water was used for an artificial horizon
when there was no wind; but where this could not be
used by reason of wind molasses was ~~used~~ substituted.
Results of equal altitudes taken this Day

1st pr.	11.57—18.30	
2nd Do	11.57—09.30	
3d Do	11.57—09.30	
4 Do	11.57 11.30	H m s m
Sum	47.48. 49.00	Mean 11.57.12.15

Philosophical & Astronomical Observations

H m s m
11.57.12.15
Equation +15.00 for change of Declination } by Dunbars method. See
11. 57 27.15 Solar noon by clock } Philosophical Transaction Vol. 6 page
12 } 260 No. 42~ See page 96 journal
0 2. 32. 45 clock slow at noon (Solar time)

P.M.

At 7.25.00	Comets from arcturus	39°-36’	Given by
7.37.00	Do from Alioth	15-40	Watch. Index
7.41.57	Do from last T. Uill.	10.50	error 4’.52”
7.48.32	Do from last in Tail	21.03	
7.53.23	Do from north pointer	18.24.30	
7.50.39	Do from South pointer	13.55.00	

18 September morning very foggy, About 10 oclock
Sun appeared

Equal Altitudes.

forenoon			afternoon	
10-4-57	Alt. (double)	84°-11’	1.49-48	
10-8-11	Do	85.00	1-46-02	Sextant.
10.12.35	Do	86.00	1-42-49	Day windy,
		H m		Suns image
Results	1 pair	11. 57.22.30		from molasses
	2 Do	11.57.06.30		and not well
	3 Do	11.57.42.00		defined; of course
		2171 00		a little doubtful
		11.57.35. 30		
	Equation	1-15.		
	Subtract	11.57.50.30	Solar noon by clock	
	from	12		
		2.09.30	Clock show Solar time	

~~Clock 17th 2’ 33”.21’’’~~
~~Do 18 2 10.06~~
~~23.15~~
~~Gam of Clock in 2 ½ hours~~

Index error 1 hr day 4 minutes 17”

Astronomical Observations

18 September

	H			
at	7—40—00	Comet from Double (V U May)	8°--42’	
P.M.	7—49.47	Do from N. Star	45.38	Error
	7—55—22	Do from Arturus	39—13	of
	8—07.00	Do from Alioth	14—35	Sextant 4’—17”
	8—09-00	Do from last in Tail	19--38	

Comets declination, at 8 oclock P.M. deduced from compare son with known stars and distance measured. 46°--03’ North

Right Ascension $11^h\ 45^m\ 51^s$ = 175—57’—45”

19 Day fair with flying clouds.

Equal Altitudes

Forenoon	Alt.	Afternoon	
H		H	
8—23—10	54°	3—30—33	Suns lower limb
8—32—07	57	3—21—31	Arch of ex ap 36’—30”
8—41—22	60	3—12—23	Do forward 28—30
8—48—06	62	3—06—06	2)8—00
8—57—28	65	2—56—43	Index error 4-

Results of above		H m s third
NB. At 8^h oclock 15 MM	1 pr	11.56.51.30
put watch 4’ forward	2d	11.56.49.00
	3d	11.56.52.30
	4^{th}	11.57.06.00
	5^{th}	11.57.05.30
	Sum	59.44.44.30
	Mean	11.56.56.54
	Equation for	+ 15. change Declination
		11.57.11.54

Astronomical Observations &c

Solar Noon by the Clock	H m s tr	Mean noon	Clock fast mean time	Daily diff.
17th	11. 57. 27. 15	11.54.40	2'-47"-15'''	
18th	11 57. 50. 30	11.54.19	3.31.30	44"-15"' gain
19th	11-57. 11. 54	11.53.58	3.13.54	17.36 loss

The altitudes taken the 18th were probably a little variant from the truth: As the wind was high and the molasses made use of for a horizon, was in a state of fermentation; which rendered the suns image indistinct. Rejecting these altitudes and using those for the 19th it will be found that the clock gained 26".39"' in 48 hours. Say 13" in 2h hours. Hence 24^h : 13":: 43' : 23"': and 24:18:: 3^h.48' : 2": 3"' ~
From the data above, it follows that the Eclipse on the 17th of the September, began and ended as follows. Viz.

	H m s th.	
Beginning at	0 – 45 – 36 – 22	Apparent time
End	3 – 50 – 29 – 42	PM~
Duration	3 – 04 – 53 – 20	

Digits eclipsed 10 2/3 (on South Side) by micrometrical admeasurement.

Variation of Needle deduced from ~~deduced from~~
Magnetic Viz. 46°-- 45' taken the 16 instant (See page 91)
5°--43' West~

operation

Astronomical Observations &c

Operation for the equation of equal altitudes
Viz for Sept. 17, 1811

Latitude 42°- 2’8 Co S.		9.86786
Half elapsed time of interval or time of the corresponding alts. See page 91-3d par for 17 September in degrees	46—09	9.85883 Sine
True Alt. 32°-38’ Sec		10.07381
Rejecting 10 index Sine 39°.05’		9.79970
Co. Tang. 39°-05’		10.09034
Suns Decl. Sept 17, 2°. 28. Sec.		10.00040
Decrease of Suns Decl. in half interval	Log.	1.07910
in seconds of time 12 seconds		1.16992

Log. 14”, 79 addative

21st September

P.M.	At	7—35 – 30	Comet Azimuth 42° NW alt 18°-- 30’
By Clock		8 – 12 – 30	Do from Arcturus northerly 36° -- 39’
at home		8 – 18 –15	Do from Pole Star west 44.17
		8 – 22 – 00	Do from Alioth N.W. 11—40
		8 – 28 – 00	Do last in trail N 15.50.30
		8 – 36 – 30	Do duble west 7. 49. 30 = tail

Meridian alt of a Aquclae double 111.37 – 30
Index error 4’ minutes. addative

Astronomical Observations

Operation for Latitude

Double Alt of a aquilae 111° -- 37' – 30"
Index error + 4
2) 111.41 .30
Refraction 38
True alt 55 . 50. 07
from 90
Sin. Dist. 34. 09. 53
True Declination +8 22 39
Latitude 42. 32. 32 North

Decl. for 1800 8°-- 21'
Varia tion for +1.39
11 2/3 year 8.22.39

To find the time from the Alt. of a agilac taken Sept 10 See page 88

True alt corrected for index error & refraction 55° -- 32' – 37
Lat of Deerfield 42—28 42 – 28 – 00 Sec 0.13214
Stars polar distance 81. 37. 21 Co Sec. 0.00467
2)179- 37. 58
Half sum 89—48 –59 Co Sine 7.50572
Stars altitude 55 – 32 – 37
Remainder 34. 16 22 Sine 9.75054
H m s 2)17.39247
Sine 0—22. 47 8.69623

[ ] index on 1st fig.

For Stars Ret.
Ret 10100 – 19^h. 41.01
Variation in 11 ½ years +34
True R.A. 19.41.35
For Declination of Star
Decl. 1800 8.21 N.
Variations 11 2/3 years + 1.39
True Declination 8.22.39
from 90
Polar Star 81.37.21

Stars R.A. 19. 41 35
R. A. of Merid. 20. 04. 22
Suns R.A. 11- 11- 16
True nearly 8. 53. 06
Correction 2. 03
True time 8. 51. 03 by Star

True time $8^h51^m03^s$
Do by Watch 8.50.30
Watch slow 0.0.33
therefore the observ bances on the 10th page 88 are to be corrected accordingly

Astronomical Observations

September 23

at	8.02.45	Comets from P Star west	43°. 38'—30"
	8.09.27	Do from Arcturus North	34.56.—00
	8.15.00	Do from last in tail	13.02.30
P.M.	8-21-00	Do from A Lyrae North	64.22.30
my Clock	8.25.45	Do from North Pointer	18.42.00 Southerly
	8.30-40	Do from Alioth South	10.00.00

Mu. Alt of a [ ] (Double) 111.36.30 Index error 4'
Latitude deduced 42°.33'.02" N.

September 24.

Attempted to correct the index error of Sextant and found it by observation as follows

1 Diameter of Sun on 34'
Do off - 30
Diff. 4
half Diff. 2 = index error

2 Diameter of sun on 34'30"
Do off 29.
Diff 5.30
½ Diff 2.45 = index error

3 By [ ] of [ ] 2.30 = index error

1st 2'
2d 2.45
3 2.30
3)7.15
mean= 2.25 subtracted

Astronomical Observations

Results of observations for the time deduced from the Alt. of
the stars whose altitudes were taken Sept. 13 (page 89)

		H m s	
Viz By a Lyrae	5'-- 35" fast at	9—59—20	
Do Do	6 –04 Do at	10—08—05	Solar
Do a Aquilae	6—12 Do at	10—16—10	time
Mean of above	5—57 Do at	10—07—51 2/3	solar time

Therefore the observation of 13th Sept require 5'—57" correction~

Results of Altitudes on Stars the 14th page 89

		H m s	
Viz By a aquilae	6'--17" fast at	9. 3-20	Solar
Do	6—57 Do at	9.12.14	T.
Mean of Do	6.37 Do	9.07-47	Sola T.

Therefore observation for 14th require a correction 6'.37 fast

Results of equal altitudes taken on 15 September page 90

	H m s
1st pair	12.06.20
2d Do	12.05.51
3 Do	12.05.40
	3 17 51

mean 5.57 fast solar time

Equation + 14,4

6.11.4 fast Do. corrected.

Results of equal Altitudes 16th Dept page 91.

1st p	11.57.07			
2	11.56.56			
3	11.57.03			
4	11.56.45			
5	11.57.53			
6	11.57.10	H m s	H	
Mean	11.57.09 + 14",4 =	11.57.23.4 from	12 =	2'.36.6 Slow

Solar time

Astronomical Observation

September 26 H

P.M. at 8—07—00 Comet from Pole Star (west) 42°-54’ } Index
8—14—00 Do from Arcturus (north) 33.24 } error
8—20—30 Do from a Lyrae (NW) 60-24 } 2’.25”
8—25—30 Do from (Aliotia) (below tail) 8—19 } Subtracted
= 8—19

Note the Comet is now on the Constellation of Ursa Major a little below the tail. Right Ascension $12^{H}.45^{m}$—45^{s} and Declination 48°--48’ by comparison with known stars

September 29

PM at 7—48—00 Comet from aliotia (west) 8°..30 }
7—52 Do from a Lyrae northerly 56—09 }
7—55 Do from arcturus north 31—15 }
8—01 Do from P Star 42—23 }
8—07 Do from last in tail 5—09 }

October 1

P.M. at $6^{H}.49^{m}$ Comet from last in tail below 2°.12’.30”
7—17 Do from arcturus, north 30.23.00
7---32 Do from A Lyrae below 53.16.30
7—43 Do from Pole Star Do 42.09.30

9. 05 Double alt a Lyrae 109.58.30 } Index
9.11.15 Do do 107.43 } error
37” Sub.
tracted

Astronomical Observations

October 3d

P.M. at 9^{H}—16^{m} Comet Distance from a Lyrea 50—00—30

9 – 25 Do from Pole Star 42—07--

9. 29 double alt a Lyrae 101—06 index error 15” addative

Oct. 4 measuration of suns Diameter

on 30’—30” } on 31’—00 } mean Result 1 minute addative

off 33—30 } off 32—00 }

Oct. 5 H

PM at 7—37 Comet from Arcturus (Northerly) 29°--08’

x7.42.45 Do a Lyrae northwest 42—12—30 doubtful

7.53 Do Pole Star west 42—12—00

8.02 Do North pointer 29—16 –

8.07—15 Do last in tail 4—25—30

8.10.15 Do a Corona Borealis North 26.57—30

8.29.45 Double Alt a Lyrae 122—05—00

8.39--- Do Do 118.27

Suns diameter on 3’5—30” } on 35 } mean Result

off 29—30 } off 29 } 3.’00

The Comet has now passed the tail of Ursa Major a little west of the last star (on the tail). The nucleus is not very distinct. The tail is about 15 degrees in length, and very bright in the absence of the moon Subtraction

Astronomical Observations

~~September~~ October 8 scattering clouds

PM at 7^H—46^m Comets from a Lyrae (west) 42°--17'—30"
7—54 Do last in tail South 9—30—00
8—05 Do Pole Star (West) 42—53—30
8—12 Planet Mars (North) 91—12—30
} Index error

8—28 Double Alt. a Lyrae 113—06—00
8.33:20 Do Do Do 111.52.00
} Index error

Tail about 15 degrees long, & bright. Nucleus not distinct.

Note Suns Meridian altitude on the 5^{th} instant
viz lower limb & double alt 85°--20'—30'
Operation for Lat. index error -- 3
2) 85 17. 30
42.38.45
Semi Diam. + 16.02
Apparent Alt. 42:54.47
Refraction 1.01
Comet alt. 42.53.46
90
Zen. dist. 47.06.14
Suns dist. S. -4.32.35
Latitude 42 33:39 N

Results of Altitudes
for time taken Oct 1.3
∟5. Viz. (a Lyrae)
1^{st} watch slow 3'—07" } solar
Do 2.08 } time
2)5.15
mean 2.37.30
3d watch fast 4.27.00
5^{th} Do fast 9.51.00
Do fast 8.17 00
2)18.08
9.04 mean

Astronomical Observations

October 9— H

P.M. at 7.02—15 Comet from Arturus above 29°--21'—00"
7—08—30 do a Lyrae below 40—44—30
7—16—00 do Pole star do 43—03—00
7—35—30 do Mars North 90—11—30
7—53-- double alt a aquilae 105—49—30
8.01-- Do do a Lyrae 124—32—30

Oct 10 Mensuration of Suns Diameter
Viz on—34'. 30" off 29'—00 } Index error 2'-45"
on –35—00 off 29—30 } Subtractive.
erroneous

October 11 Double Meridian alt Suns lower limb 80°-44'.30"
PM. 7^{H}—4—00 Comets azimuth 56°.30' NW. Alt. 39°--03'
7—09—30 Do from a Lyrae (bel) 37.28
Two Altitudes of a Lyrae omitted.
7—18—00 Do from Arturus 30—09 above
7—23.00 Do from a Corona B. 20.20 North
7.35—45 Do from Pole Star (B.) 43.45
Last in tail U Maj: Magnetic Az. 35°,30' NW alt 22°.38'

Oct 12. AM. Decline of Moon & Suns nearest limbs 53°--26' at 17^{H}—53"—25
H 1 Do do 53—24 ~~30"~~ 7.59.15
at 8.35 Double alt Suns lower limb 41—31—30
8—40 Do 43.42.00
8.42 Do 43.42.00

Mensuration of Suns Diameter on 34'.30" off 30'-30" } mean error
on 35. 00 30.30 } 2'.07"-30" Sub

Astronomical Observations

13th Suns Diameter on 33'—15" off—31'—30" } 52 ½" for error Sub.
on 31—15-- 33.00 } 1' 22". 30"' addative
on 31—30 33—30 } afternoon

PM at 7—18—00 Comet from a Lyrae below 34°--04'—00
7—24-- from Arturus above 30—44—30
7—28 from a Cor. Bor. North 18—52—30
7—36—15 from Pole Stare below 44—54—30

Note Double alt. (mer) Sirius 62.04—30 taken on 12th
~~Index~~. Lat from above 42°.33' N.

The weather for several Days past ~~the weather~~ has been as
warm as is common/usual in July. Can this be caused by the Comet?
Variation of Compass deduced from azimuth of star last in tail
of Ursa Majs. (See obsuredence for 11th instant) 6°--04 W.

H

At 8.35—30 double alt of a Lyrae 108°.42'
8—42.30 Do do 106—10

Results of above By 1st observation 8'—40" fast } (watch)
for time By 2d Do 13.38 fast }
Mean of above 11.09 fast }

Results of observation } 8th October mean 4'—33" slow }
for time viz on the } 9th Oct mean 3.22 ½ fast } Stars
11th Oct mean 3.40 fast }
12th Oct mean of }
3 observation of sun } 5.54 fast

Astronomical Observations

October 17 H

P.M. at 7—03—00 Comets from arcturus above 34°--09'—30"
7—06—00 Do A Lyrae below 27—28—00
7—08—00 Do a Ca. B. Northerly 18—07—00
7—11—25 Do last in Tail U.M. (S.) 25—33—30
7—14—30 Do Pole Star 47—19—30
7—17—45 Do a Aquilae North 58—29—00
Distance between a Lyrae & a Cor Borealis 39.45—30

H m s
at 7—47—35 double alt. a Lyrae 118—11—00
PM 7.51—45 Do do 117.13—00
For index error Suns diameter { on 31' off 34'—15" } mean
{ on 31.15 off 34-- } 1'.30" add
The nucleus is more distinct this evening, than I have seen it. The air very clear. A convexity on the south side of the tail is now obvious.

Octr 18~ H

PM at 7—21—15 Comet from arturus above 35°--01'—00"
7—26—00 do a Lyrae below 25—51—00
7—28—30 do a Cor. Boreallis (N) 18—35—00
7—32—10 do Pole star below 47—54—00
7—36—45 do last in tail south 27—11—00
7—47—20 do a aquilae below 56—52—00
7—54—00 do planet Mars 78—16—30
} Index error

Double alt of a Lyrae at 8^{H}—05^{m}—00 = 112°--12'—30"
Do do do 8—08—40 = 111—00—45.
Comet distinct air clear stars very bright.

Astronomical Observations

18th Continued

At 10H—5m—45s Comets azimuth 47°--10'NW, Alt. 12°--01'
Maj. Azimuth of Alioth 6—20 SW. Alt. 11°--15'
Traced a Meridian by ~~by~~ a Transit of Alioth and the
polar star over the meridian, according to Mr Elicotts method.
variation of needle as observed by Circumferentor, 6°--10W (probably to large)
Results of observations of a Lyrae for time taken 17th—2'—28" watch fast } means
Do of observation of Do do 18th 7—47 Do }
Variation of needle from az. of alioth taken the 18th 5°--26' W
19 October observations suns diameter for index error
on 31'—45" off 33'—30" error 52 1/2" additive
21 October
AM 8—31—30 double alt. ʘs ʊ = 37°--19'—40"
8—38—35 Do do 39—40—00
Suns diameter on 32'—15" off 33' error 22 ½" forenoon added
on 32.15 off 32 do 7 ½" afternoon subtract
Suns double meridian alt. lower limb 73°--19'—40"
PM at 7H—49m—20s Distance of farthest limb of moon & a aquilae 45°--9'—30"

7—54—30	Comet from a Lyrae (B)	21°--19—30"	
7—57—45	from a Cor B. above	20—05—00	
8—01—09	from a quilae	51—23—00	error
8—06—20	from last in Tail U.M	32—37—30	7 ½" Sub
8—10—10	from Pole Star	50—19—00	tractive
8—13—15	from a Cygnabulae	42—33—30	

Astronomical Observations

Double Alt a Lyrae
at 8^{H}—18^{m}—00 alt 104°--12'—30" } Index error 7 ½" Subtraction
PM 8—24—00 alt 101—47—00 }
Length of Comets Tail 14 degrees. Air very clear tail distinct. Comet nearly in a line between arturus & a Lyrae but a little north.

Elements of the orbit of the Comet ~~(near visible)~~ Calculated by the scientific Nathaniel Bowditch Esqr. of Salem

The Geocentric longitudes and latitudes of the Comet, used in finding the Elements of the orbit, were deduced from distances of the Comet from Arcturus Lyrae and Doube observed at Cambridge by Professor Farrer, and at Nantucket by the Hon. Walter Folger, Jr. By combining the observations of Sept. 6, 9, 12, 15, 18 & 23, the elements of the orbit were found by the method of La Place, and corrected by the observations of Sept. 6, 15 and 23.

Perihelion distance 1,052. The mean distance of the earth ~~being 1~~ from sun being 1.
Time of passing the perihelion Sept. 6^{th} 1811 at 18 hours Greenwich time.

Astronomical Observations

Place of perihelion counted on the orbit of the Comet 2^s..21°
Longitude of ascending node, 4^s 18 degrees
Inclination of the orbit to the ecliptic, 74 degrees.
Molion retrograde.

The distances of the Comet from the earth, expressed in parts of the suns distance from the earth, estimated at 10, were found in February 1811, to be 30: in June, when visible at the Cape of Good Hope and at other places south of the equator 23; on the 6th of Sept. 17 About the middle of October it will be at its least distance, 13' after which it will increase, and in the month of December it will be about as far distant as in June. In the latter part of January and in February, 1812, the distance will be above 30; the latitude of the Comet will then be small; and as it will be nearly in conjunction with the Sun, it will probably then be invisible. The least distance of the Comet from the Earth is about 120 millions of miles. The least distance of the Comet from the Sun, 100 millions of miles.~ The tail of the Comet has

has been observed to be ~~about~~ 10 or 12 degrees in length, which would make its real length nearly equal to half the dist ance of the earth from the sun.

These elements will require some corrections (perhaps two or three degrees) to be determined when a greater number of observations, on a longer arch of the orbit shall be made. The observations made early in September, were liable to a small error, form the uncertainty of the refraction, the Comet having been observed near the horizon.

These elements differ from ~~all~~ those of all the Comets whose orbits have been calculated; as may be seen by examining the tables of La Lande and Vince, or that in Rees's Cyclopaedia under the article "Comet." The Comet is therefore one that has been before unknown to aston omers.

Wishing to estimate nearly the apparent course of the Comet from these elements, I described a circle on a stiff piece paper to represent the orbit of the earth and a parabola corresponding to it, for the orbit of the Comet (similar to Fig. 267 Vol. 3 Edit. 3 of La Lande's Astronomy) and marked on these curves the places of those bodies for each day of the present year. A Slit being cut through the

circle in the direction of the line of Nodes, the parabola was inserted so as to be inclined to the ecliptic by an angle of 74° the point representing the perihelion being above the plain of the ecliptic, so as to make the angle at the sun by the perihelion and node 57°. By this apparatus the following estimate of the apparent course of the Comet and its distance from the earth were made.

In the month of February 1811 the Comet was near to the eastern part of the Constellation Argo. Its motion was then west inclining to the north. It passed a few de grees to the eastward of the great Dog, and its direction then became nearly north, being stationary in Long. in the month of May. It passed near to the eastern part of the lesser Dog, early in June, inclining rather towards the east. On the 16th July it passed the ascen ing node in the Long. of about 4S 8 degrees, and then moved northeasterly towards the feet of the great Bear where it was first seen, after the conjunction with the sun, on the 6th of September. On the 5th of October it was near the right of Bootes. It will be at its greatest north Lat. about the middle of Octr. near the right foot of Hercules, after which it will begin to move, towards the ecliptic, through the

Astronomical Observations

left knee of Hercules, toward the Eagle ~~and~~ the Dolphin
the water bearer &c. It will be near the Eagle about the
1st of December. It is to be observed that the apparent positions
thus roughly estimated are liable to an error of 2 or 3
degrees. The orbit of the Comet falls without the Earths
orbit." Therefor Mr Bowditch as published in the papers
Latitude of Salem 42°--33'—30" N } according to Mr Bowditch, taken
Longitude 70—53—00 W } near the centre of the place

October 23d

	H m			
PM. at	6—19	Comet from a Lyrae below	18°--33'—30"	
	6—30	from Arcturus above	40—24—30	
	6—35	from last in tail U.M. south	35—54—00	Index
	6—38	from A Cor. Bor above	21—34—30	error
	6—43	from a aquilia NW	47—52—00	
	6—46	from a Cygri below	40—51—00	
	6—54	from Pole star SW	52—05—00	
For the	7—38	double alt. a Lyrae	116—16—30*	
time	7—45	Do Do	114—00—00	

Comet a little north of a line from a Lyrae and arcturus
The tail less distinct on account of the moon's light. The
nucleus is more distinct than it has been.

Astronomical Observations

26 October

	H		° ‘ ”
PM at	6—52—00	Comet from a Lyrae below	14 – 54—00
	6—58—00	from a Corona Bor. above	24—48—00
	7—02—00	from a aquilea north	42—55—00
	7—09—00	from Saturn north	58—03—00
	7—12—00	from Mars Do	67—24—30
	7—21—00	from a Cygna below	38—14—00
Time	7—49—00	doub. Alt a Lyrae	110—03—00
	7—54—00	Do do	108—20—00

Comet a little past the line from a Lyrae to a Corona.

27 October Suns diameter { on 32’—45” off 32’—15” } 112” Sub
{ on 32—45 do 32—30 } tracted

28 October

			° ‘ ”
PM	6—57—00	Comet from a Lyrae below	13—06—40
	7—01—30	do a aquilia north	39—33—30
	7—10—00	Do a Cor. Boreal. above	27—07—30
	7—17—30	Do last in tail UM	44—27—00
	7—23—00	Do a lyqua below	36—52—00
	7—29—00	Do a in Hercules (Belly)	21—01—00
Time	7—45—30	double alt a Lyrae	105—50—30
	7—47—05	Do Do	105—14—30
Its Longitude	8—04—20	Do moons LL.	77—00—10
	8—08—20	Distance nearest L D & a aquilia	63—42—45
	8—12—00	Do do Do do	63—44—00
	8—15—45	Double alt Ds L L	78—17—10

Astronomical Observations

28 continued

	H			°	’	
PM	9—18—20	Double Alt Ds LL		88	16	For Longi-tude
	9—22—45	Distance of farthest Lo D & Aldebaran		69	00	
	9—27—35	Do do	do	68	58	
	9—32—45	Do do	do	68	56	
	9—34—20	double alt. Ds L L		89	22—30”	
	Meridian Alt. Ds L L			90	01--30	

29th October

PM at	9^{H}—08—00	double Alt a Lyra		77°	58’
	9—10—40	do	do	77	02—30
Longi-tude	9—21—20	doub. Alt Ds LL		89	00—00
	9—24—40	dist. farthest L. D & Aldebaran		54	03—00
	9—31—20	Do	do	54	00—00
	9—34—05	doub. alt Ds LL		91	29—30

Comet in a line with a Cygna & a Lyrae Tail not very distinct on account of moons brightness.

Latitude of Deerfield Meeting House deduced from meridian Alt. of sun taken the 21^{st} instant (viz 73.19—40) 42°--33’—07” N~

2 November

Meridian alt. (double) of Θs LL 65°--10’

This gives the Lat 42°--33’—15 N.

Astronomical Observations

2 November continued.

Suns Diameter on 31'—45" } on 32'—00" }
off 33.30 } off 33—30 } error 48"+

	H		° ' "
PM at	7—05	Comet from a Lyrae below	11—36—30
	7—22	from a aquilia north	31—45—00
	7—27	from a Cygrae below	34—25—30
	7—47	Double alt. a Lyrae	95—19—00

Comet tail much less than it has been nucleus not very distant.

4 November

Medium Alt. Suns LL 63°--55' (doble) Index error 30"+

Latitude deduced 42°--33'—01"

Suns Diameter on 32'.15" off 33'—15" on 32'.30" Erro 30" as above

	H m		° ' "
PM	6—21—00	Comet from a Lyrae below	12—15—00
	6—27—00	from a aquilia (Right)	28—58—00
	6—34—00	from A Cor. Bor	35—45—30
	6—39—00	from Last in tail U M Left	55—00—00
	6—43—30	from a Cygna below	33—56—30
	6—47—15	from (a Hercules) above	17—34—30
	6—53—00	Pole star Left	63—08—00
	7—08—00	double alt. a Lyra	108—12—00*
	7—12—00	do do do	107—11—00
	Length of tail of Comet		9—30—00

Astronomical Observations

9 November

PM	6—44	double alt a Lyrae	105—29
	6—48	Comet from Do	15—39
	6—51	do a aquilea	22—15
	7—46	do a Cygra	33—14—30

10 November

PM	9—17—30	Double Alt aldebaran	65—37—30
	9—23--	Comet from a Lyra	16—53—00
	9—27--	from a aquilea	20—52
	9—31	from Polaris	68—03
	9—35	from Cassiopea	72—13—
	9—49	Double Alt Aldebaran	76—19--*

Comets nucleus indistinct

11 November

Suns Diameter on 29’—30 off 34—30—on 29—50 off 34’—20”

Result 2’—22” +

12 November

PM	6—31—00	Comet from a Lyrae	18°--10’—30”
	6.36	from a aquilea	18—36—00
	6—43	from a Hercules	20—00—00
	6—48	from a lyrae	33—21—
	~~6—54~~	~~from a Pegase~~	
	7—05	Double alt a Lyrae	97—28—30

Comet Nucleus very indistinct Cannot be seen through
the long telescope so as to determine the contact with 5’ or 6’.

Astronomical Observations

November 15.

AM 10 hours.

ʘs alt ⌢	20°--38°	Mag. azimuth left L.		148°--51	from North
Do do	21—23	Do	Do	150—13	Do
Do do	23—09	Do	Do	153—35	Do
Do do	23—26	Do	Do	154—12	Do

November (17)

PM at 6—10	Comet from a aquilia (right)		13°--08’
6—15	from a Lyrae (left)		22—32—30
6—22	from a Cor. Bor. above		50—10—30
6—26	from a Cygra below		33—57—30

Watch right Solar time.

November 18 Comet from H ‘ “

PM 6.27	a Lyrae left	23—22—30
6.31	a aquilia right	12—05—
6.37	a Cor Borealis above	51—11—30
6.42	a Hercules above	23—55
6.47	a Cygma below	34—07
6—56—30	double alt. a Lyrae	89.111

November 22

Suns Diameter on 30.’30’ off 34’—30” Result 1’—45”+

23 Do Do on 30—off 35—30 Result 2 45 +

Double mer. alt ʘL L 53—49—30. Lat deduced 42°--33’—09”

Astronomical Observations

	H		° ‘ “
November 25. PM at	7—40	Comet from a aquilia right	5—32—00
	7—45	from a Lyrae left	28—59—30
	7—50	from a Cygna below	35—41—00
	8—00	from a Pagasi below	51—07—30
November 26			
PM at	5—42	Doble alt a Lyra	105°--56’
	6—44	Comet from Do	29—43
	6—55	from a aquilia	4—44
	7—00	from a Cygna	35—57—30
	7—08	from Mars	38—18

November 28 Sun Diameter on 31’ off 34’—15” Result 1’—37” +

	H		° ‘
December 2d	6—15	Comet from a Lyrae left	33—50
	6—20	from a aquilea (above)	00—22—50
	6—25	from a Cygna below	37—31—
	6—33	from a Pegasi below	47—33
	6—54	Double Alt. a Lyra	73—35

To the naked eye the Comet and a aquilia appear very near a contact. Indeed the star seems to be the nucleus from which the tail proceeds; this last is much diminished the length about 4 degrees.

	H m s
The R. Ascension of a aquilia by Tacks Tables	19.41.33
Declination of Do by Do	8.22.33

This give the place of the Comet nearly.

Astronomical Observation

December 4	H	m		° ‘ “
PM	6	—20	Comet from a aquilia (left)	1—17--30
	6	—30	from a Lyrae left	35—03—
	6	—33	from Cygnae left	38—03—30
	6	—36	from a Pagasi below	46—37—15
	6	—46	double alt a Lyrae	72—40

December 8th

Suns Diameter on 29’30” off 36’ 30” Index error 3’+

	h	m		
PM	7.	00	Comet from a Lyrae left	37°--20’
	7.	10	from a Aquilia left	3—53
	7.	15	from a Pegasi below	44..48

December 14th PM

7.	10	Comet from Fomalhaut right	51°..44
7.	20	from a Aqilia left	7. 33
7.	25	from a Pegasi below	40. 20

December 15th

Sun’s diameter on 30’ off 36’ Index error 3+

December 17th

Sun’s diameter on 30’ off 36’ Index error 3+

Double meridian Alt. sun’s L.L. 47°, 40’ Lat. deduced 42°.32’58”

February 1st 1812.

Mag. Ar. Sirrus 130°, 45’ from north towards East Alt. 11°. 30’

Do	Do	131.30	Do	Do	12..09
Do	Do	132.30	Do	Do	12.42
Do	Do	133.00	Do	Do	13.09
Do	Do	133.35	Do	Do	13.40

18. Results from the foregoing Astronomical Observations.

Latitude of Deerfield meeting House 42°..32'..30" North
Longitude of Do 72—41—00 west from
Greenfield by Paine 72.36 Greenwich
Northampton by Do 72.40
Variation of Needle, in 1812 5—28 West; & sup
posed to be stationary, or nearly so.

Note The above are ~~deduced from~~ the means of the
several observations.

Rule to find the index error of the Sextant.

The index error is the number of degrees, minutes &c indicated by the noni us, when the direct and reflected images of an object coincide with each other. To find the error, bring the limb of the suns image to coincide with its limb seen directly, both on the quadrantal arc, and on the arc of excess.

If the diameter taken by moving the index forward on the quadrantal arc be greater than that taken on the arc of excess, then half the differ ence is to be subtracted; but if the diameter taken on the arc of excess be greater than that by the quadrantal arc, half the difference is to be added. If the numbers be the same in both cases the glasses are truly parallel and there is no index error.

Extract from Hume's History of the Reign of James 1st
See his History of England Vol. 5 page 572

~~19~~ 22

In tracing the coherence among the systems of modern theology, we may observe, that the doctrine of Absolute [ ] has ever been intimately connected with the enthusiastic spirit; as that doctrine affords the highest subject of joy, triumph, & security. to the supposed elect, and exalts them, by infinite degrees, above the rest of mankind. All the first reformed adopted these principles; and the Jansenists , a fanatical set in France, not to mention the mahometans in Asia, have even embraced them. As the Lutheran establishments were subjected to episcopal jurisdiction, their enthusiastic genius gradually decayed, and men had leisure to perceive the absurdity of supposing God to punish, by infinite torments, what he himself, from all eternity, had unchangably decreed. The king, tho' at this time, his Calvinistic education had rivetted him in the doctrine of absolute [?], yet, being a zealous partizan of episcopacy, was insensibly engaged, towards the end of his reign, to favour the milder theology

of Arminius. Even in so great a doctor, the genius of the religion prevailed over its speculative tenets; and, with him, the whole clergy gradually dropped the more rigid principles of absolute reprobation and unconditional [ ] (----------)

And upon the restoration, the church, tho she still retained her old subscriptions and articles of faith, was found to have totally changed her speculative doctrines, and to have embraced tenets more suitable to the genius of her discipline and worship, without its being possible to assign the precise period, in which the alteration was produced~

For the rise of Enthusiasm, and for rational remarks on this spirit, See Locke's Essay on the Human understanding Chap . 19 Book 4th Vol 2d And as an antidote to Enthusiasm See Chap 20 Same Book & Vol. (of wrong assert, or error.)

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23 Notice of New Publications, Continued from page 87

Major Landman's account of Portugal in 14 parts, will speedily be completed, and will consist of historical, military and picturesque observations on Portugal; illustrated with numerous coloured views and authentic plans of all the sieges and battles fought in the Peninsula during the

late war. The engravings about 70 in number are accurately coloured, from original drawings of the author. London Monthly Magazine for Jany 1816.

Munroe & Frances, N4 Cornhill Boston, offers for sale (April 1816) Elements of Fortification; by Lewis Lochee, Master of the Military Academy at Little Chelsea. With large plates.

Elementary Fortification. Illustrated by upwards of 500 diagrams in wood and several engravings. By Lieut Col C W Pasley author of Essay on Military Policy.8vo London April 1816

During the year 1815 thee were published in France, 674 works on various subjects; if which 16 are on the military Art. Panorama April 1816

The Principles of War exhibited in the Practice of the Camp. 10/6 London Mag July 1815

Robert Wilson's Brief Remarks on the character & composition of the Russian Armies 1 Vol 4to 200 pages (valuable work)

Royal Military Chronicle, (a periodical publication, London) 1 Vol 8vo at Boston Dec 1816. Seen by Messr Hoyt

A Complete map of the Field of Waterloo, showing its minutiae and the position of the Armies, when the French re-

treated, with views of each contested point, is preparing by Wharton of Greys Inn Square London 1816

My Bowyer is preparing for publication (under the patronage of his Royal Highness the Prince Regent) a spendidly illustrated work on the late brilliant campaign of Waterloo London 1816.

Capt O'Connor of the US. Artillery , has for some time been engaged by order of the War Department, in translating from the French , a celebrated treatise on the Science of War and fortification, originally composed by the order of Napoleon for the use of the students of of the imperial polytechnic & military schools of France. This work embraces the whole science of War, and field and permanent fortification, with all the modern inventions and improvements in the latter branches; and in France, is universally used by the military and is esteemed beyond all other productions on those subjects, being considered as a masterpiece. Shortly to be published June 1817.

Arch Duke Charles is employing his leisure hours on a work to be called " Commentaries on the Principles of the Art of War. 1816.

Observations of a Veteran on the Principles of War, military Economy, Education and Discipline &c Comprising a Review of the prominent events of the Wars of the last Century Price 10/6 boards English

Relation of the operations and Battles of the Austrian & French Armies in the year 1809 with 3 plans of the Danube and the Battle of Wagram. By W. Muller. Price 6/- in Boards English

Literary Intelligence

The Aid De Camp, or staff officer assistant, containing correct statements of the pay allowances and contingences granted to every officer employed on the Staff in Great Britain Price 6/- in Boards

Tielke's account of Events of the Seven Years War translated by Messrs Crawford Thieleke

old works

History of British Dominions in North America from the first Discovery of the Continent by S. Cabot in 1497 to the Peace of 1763. London 1773 - 4to Quoted by Holmes see Annals
Charlevoix (Pere de) Histoire de la France Nouvelle Paris 1744. 3 Vol 4to
Do France in NAmerica Lond. 1763 2vol 8vo
Champlain (Sieur de) Voyages de la Canada Paris 1744 8vo
Remembrances from 1775 to 1784 London (Almon) 17 Vol 8vo
Smith (William) History of the Province of NYork to D. 1732 London 1757 4to
Stedman's History of American War London 1794—2 Vol- 4to plates
Universal History (Modern part) Lond. 1763. Vols 36.40.41. 8vo for History of the war of 1755
Wynne's History of the British Empire in America London 1770- 2V. 800.
Review of military operations in North America from Commencement of French hostilities in 1753 to the Surrender of Oswego 16 August 1756 in a letter to a Nobleman 1 Vol . 12 mo See Historical collections

Pasley's (Lieut Col) Course of Military Instruction, originally composed for the use of the Royal Engineer department, with 1190 engravings. 3 Vol. Board $22.50 ~
For sale by Eastman & Co. New York . 1817

24

Distressing Intelligence

January 24th, 1817 I received a letter from my son in law, David J. Dickinson, dated Glens Falls, State of New York, January 13th and 14th, announcing that my Daughter Fanny was delivered of a son on the 8th instant and on the 14th died of a putrid fever‡. I cannot better describe the distress , occasioned by this intelligence , than by the following letter which I wrote him, by his Brother Rodolphus who with his wife and Sister Clarissa, set out for the Falls on the 27th.

Deerfield January 26th 1817

Dear David,

Your letter of the 13th and 14th instant was received the 24th- "Fanny is no more." Is this true? O God! I must believe it so. Delivered of a son on the 8th and a corpse on the 14th. (___ ____ ___ ___ ____ ____ _____) Fill the blanks with everything a fond father could express in his calmest moments.

Our family were in full possession of all their usual enjoyments when your letter arrived. The black seal indicated something inauspicious. With trembling hands I open the letter— hopes revive on reading the first lines—" the mothers sufferings were then deemed light" The word then, dreadfully ominous. "A relapse hath occurred that shields around a doubtful uncertainty

‡See Article 23 of this Vol. for a copy.

tainty. The morrow is uncertain." Here I pause with anxiety, but the eyes soon steal along the lines and meet the following: "Morn of the 14th instant. The close has come! She is no more."—With eagerness she inquires. "Is there a letter from David?"—Yes! "Is Fanny well"? I have a letter which informs me she has been delivered of a son, and that she is unwell, very unwell, dangerously sick. Groans follow. "Is Fanny alive"? I fear not. "O tell me <u>is</u> Fanny dead'? I pause, but this adds distress to the scene. I inform that she is dead! Here let me leave another (____ _____ _____ ____) The mother becomes a little more calm and I read the letter. "Is Fanny dead"? is the distracting inquiry of all the family—It is too true, she is dead! –All in tears—When a little composed I proceed to your Father's house—There all well and cheerful. I sit down and pause. A little anxiety is perceptable in their countenances (it was an unusual time for me to call) "<u>Heavy news from the falls</u>! "O what"? I relate the dreadful tidings. All in tears. Sighs and sobs fill the room. I remain mute, endeavoring to suppress my grief.—Your mother accompanies me to your sister Gratia's, and soon both to my house, A sense of distress follows.

The

The melancholly tidings fly through the street—the neighbors arrive with eager inquiries "is Fanny dead'? It is so. All join in tears and sighs. – But enough of grief . I forbear.

You did not in your letter inform whether the infant was alive. We are anxious to learn of its present situation and more particulars of Fanny's death. You say you shall visit on the 16th instant. We shall look for the letter and postpone our numerous inquiries till it arrives. We were making arrangements to visit you in February, but shall now delay. If convenient we hope you will come to Deerfield with Rodolphus, where we should be extremely grateful to see you. If you have a good profile of Fanny, and can spare it, we will thank you to send the dear relic that we may once more behold the representation of the face we can see no more. If the infant is alive, & well, can it be safely brought to Deerfield? We should be glad to take care of & rear it. But we submit this altogether to your own feelings. I think there might be danger in the attempt.

With another expression of grief, for you know there is "joy in grief" I will close.

"Sweet child thy parents fondly thought,
To strew thy bride bed, not thy bier;

But

"But thou has left a being fraught
With wiles and toils and anxious fear,
For us remains a journey drear,
For thee is blest eternal prime,
Uniting in thy soft career,
Youth's blossom with the fruit of time".

———

Farewell dear Child!
"O'er the cold turf where thy pale relics sleep,
Shall fond remembrance of't repair to weep"

I am, Dear David, most affectionately
your Ep Hoyt ~

A few days after the first letter from David I received
from him the following

Glens Falls Jan 17—1817

Respected Sir,

Mine of the 14th, with all its woes on this
must have come to hand. Grief having subsided into silence
I am prepared to narrate the sickness and death of my dear
wife.

wife. The wretched husband is left to tell the melancholly tale. On the coming of the 8th at 7 o'clock she was taken ill and before 10 blessed with a son. Her pains were not excessive. On the ninth she informed me that she had not been so well for four months. On the tenth she suffered from the cholic, took physic, it abated. On the eleventh she experienced great pain in the Bowels, attended with soreness & bloating & occasional derangement. On the 12th an increase of derangement and no pain except (when moved) in the shoulders. On the 13th no pain but an alarming loss of pulsation and increased derangement, unable to speak. At nine in the evening, her extremities grew cold untill the morning of the 14th at 6 o'clock without struggle or groan, she expired. She was interred on the fifteenth. A sermon was delivered by my Friend and classmate Mr. Hamilton, an Episcopal Clergyman. The unusual concourse & the kind & sympathetic attention of the people were testimonials of respect. – In my arms is the pledge of an affectionate wife.—Image of thy dear mother. Smile not upon a Father's sorrow --: but shed a tear to worth departed! Join innocent Babe thy silence to our solitude!.

The evening preceding Fanny's death or the afternoon, the Physician informed me that she could not survive the next day. Untill then I was unacquainted with her danger. Unhappy

fate

fatal assurance; unexpectedly merged in all the miseries of
woe. How cruel is that change which comes unforeseen,
unpremeditated, 'ere mental resolution has been summoned
or warned to watch a lovely wife expire. Philosophy melts
away; and sensibility indulges in all the wantoness
of sorrow. Husband, Infant live to mourn and know
no joy but grief!

Receive to thy self & bear to thy family & mine
the blessings of thy unfortunate Son, who unable to
console his own feelings is unable to bear consolation
to others. And Remember me with kind regard.

David F. Dickinson

Tuesday the 4th of February Rodolphus Dickinson returned to
Greenfield from the Falls, with the Infant. It had been placed
under the care of a widow woman to rear by hand; but as she
took it merely out of pity to the child, she readily resigned the charge to Mrs.
Dickinson : by whose kind care, aided by her sister Cla-
rissa Dickinson, it was brought safely home. Having procured a
healthy wet nurse (with a child two months old) the infant was
brought to my house on Thursday the 6th instant.

The

The sensation produced on the arrival of the infant is better felt
than described. It was joy mixed with grief: And while we gazed on
the little treasure our agonizing wounds were opened anew, and bled
at every pore. We depicted in our minds the happiness the deceased
mother would have enjoyed in the care of her dear babe
& the rapture she would have experienced on bringing
it to her friends, had she been permitted to live. But we saw her cut
off in her prime; disappointed in her fond hopes, and a lifeless corpse.
mouldering in her "narrow house", far from her friends, never more
to cheer us in the land of the living. The scene was too tender.~
we gave sensibility full licence, and wept with bitter anguish:

The Father's Address to the Infant (From Dodsley.)

"And thou, my little cherub, left behind,
To hear a father's plaints, to share his woes,
When reason's dawn informs thy infant mind,
And thy sweet, lisping tongue shall ask the cause,
How oft with sorrow shall mine eyes run o'er,
When twining round my knees, I trace
Thy mother's smile upon thy face?
How oft to my full heart shalt thou restore
Sad memory of my joys—Ah now no more!
By blessings once enjoyed now more distresst,
More beggar by the riches once possest.

My

My little darling!—dearer to me grown
By all the tears thou'st caus'd—(O strange to hear)
Bright with a life yet dearer than thy own,
Thy cradle purchas'd with thy mother's bier;
Who now shall seek with fond delight,
Thy cradle purchas'd with thy mother's bier;
She, who with doating eyes would gaze
On all thy little artless ways,
By all thy soft endearments blest,
And clasp thee oft with transport to her breast
Alas! is gone—yet shall thou prove
A father's dearest, tenderest love:
And O sweet senseless smile, (envied state!)
NB --- As yet unconscious of thy hapless fate,
When years thy judgment shall mature,
And reason show those ills it cannot cure,
Wilt thou, a father's grief to assuage
For virtue prove the Phoenix of the earth?
(Like her, thy mother dy'd to give the birth)
And be the comfort of my age!"

Biographical Notice

Fanny was born May 29th 1794 at Deerfield, in the House formerly
owned by Jonathan Ashley Esqr at the north and of the street, where
I first commenced house keeping. During part of her infancy she was
rather feeble, but as she increased her age her constitution became firm as
that of other children. In the same year ~~1794~~ I removed with my family
to a small house in the middle lane in Deerfield, At the age of four
Fanny was put to the school of Miss Eunice Woodbridge near the center of
the village, where she continued till this excellent instructress relin-
quished the school. She afterwards attended the school of Miss White, Miss New-
ell and Miss Hannah Barnard, in this town. At the age of twelve
she entered as a student in our Academy ~~in this town~~, where under
the successive tuition of Messrs. Chester, Hildreth, & Wells, Misses Sally
Williams & Jerusha Williams she made good progress in reading
writing English Grammar, geography, arithmetic, rhetoric & painting.
In English grammar her proficiency was such that Mr. Wells, her last
Preceptor, readily granter her his certificate of her accuracy.
For a number of years she assisted me in my office of Registry of
Deeds, and became so thoroughly acquainted with the duties that,
necessarily absent, I had the utmost confidence in the correct-
ness of her management: and at all times she took from me
much of the burden of that laborious office. In 1812 she was invited

to

to take the charge of a school in Bennington Vermont, which she accepted. In this school she continued most of the summer of 1812 and 1813 and I believe discharged its duties with satisfaction to her employers. Deprived of the company of her parents & youthful associates she there learned duly to appreciate her paternal residence. In her letters she expressed great attachment for her friends and sighed for the time of her return to Deerfield. In one of them she says "How happy should I be had it been my fortune to have spent my days at home". In another "Ah! what is so refres[h]ing, so soothing, so satisfying as the placid joys of home! When I look forward to the time of my visiting it, I almost dispair"—

Having completed her time of service in the school at Bennington Fanny returned to Deerfield in the fall of 1813, and again went into my office to assist me occasionally untill I resigned it in 1814. The 1st of June 1815 she was married to David F. Dickinson Esqr of Glans Falls in the state of New York; a son of Colo Thomas W. Dickinson of Deerfield; and in October of that year removed with him to that place, where he had previously resided for some time, and entered upon the practice of Law, with Asahel Clark Esqr a gentleman of considerable eminence in his profession. In February 1816

Fanny

Fanny accompanied with her husband visited us, and in March they returned to the Falls. In October the same year she visited us the second and last time, with a Mr. Wing of Glens Falls; and in the same month her husband came after her & both returned to Falls the latter part of the month. Immediately after her arrival she informed us by letter, that she was in health and bore the journey very well. This was her last letter. Nearly six weeks elapsed before we again heard from her; during which time we were anxiously, and every mail, looking for a letter, as her then situation excited in us considerable solicitude. On 24th of January 1817 a letter, closed with a black seal, arrived, which announced that on the 8th of January Fanny was delivered of a son, and (oh painful to relate) on the 14th died of a puerperal fever. The effects of this melancholly intelligence are detailed in a letter I wrote to the distressed husband on the 24th of January, in answer to his, a copy of which is inserted in the front part of this article. By a subsequent letter he narrated the particulars of Fannys sickness & death in mournful and appropriate language. See a copy page 128.)

Fanny was of the middle size, rather slender and well proportioned; her features regular but not what are commonly called beautiful; her eyes blue indicating sprightlines and penetration; her hair dark brown, and flaxen, and her deportment affable and engaging. She was generally gay and animated but thoughtful. At times participating

~~and animated~~ participating in social mirth and inno-
cent recreation, yet never loosing for a moment a most per-
fect self command, or in the smallest degree overstepping
the bounds of that delicate decorum, which is one of the
brightest gems in the character of woman. Tenderly alive
to the happiness of her relations and friends – kind and
condescending to her inferiors – in all her words and in all
her deeds continually shone forth those amiable characters
and radiant virtues that eminate from a pure and
noble heart." She was remarkable for method and purpose
in business; industrious and economical, and her affairs
were always in the best order. What could be done
today was not put off for the morrow – She meddled not
with the business of others, and was tender of the reputation
of all. But, of her virtues it may ill become a parent
to speak, and he may be blind to her faults. These undoubtedly she had,
for she was human, but it is a consolation to believe that they
were not great: And if general esteem is a mark of worth
sure I am she was worthy. The following notice of
her was inserted in the Franklin Herald of Feby 4th 1817 by a

friend intimately acquainted with her. Perhaps it may be deemed too flattering; but I have the satisfaction to find that those to whom she was best known, consider the portrait as just.

"Mrs. Dickinson's character was such as to command the respect of all her acquaintance. All esteemed her for she was their friend. The wise esteemed her for she was their companion. The good esteemed her for she was their their sister. The wicked esteemed her for she was their monitor. The acquaintance are able to say of her, that she was possessed of those powers of intellect, united with a disposition in the highest degree amiable with a combination of virtues that constituted in her a stability and excellence of character rarely possessed of life, as the age at which she died. In all her deportment she seemed guided by those principles of wisdom found in the wise and good of more advanced years. She was faithful to her duty in the various capacities of a daughter, wife and friend. She seemed more desirous to <u>do good</u> than to be <u>thought</u> to do good. To her afflicted companion, her parents, brothers and sisters, her loss is irreparable, and many a heart shall bear testimony that a void is made in the society of the good, and many a tear shall declare that sympathy is still a native of the human breast, and that those connected by the ties of consanguinity

consanguinity are not alone affected by the departure of
this most excellent young lady."

Man's born, then breaths and laughs and sighs;
Comes forth and toils and groans and dies."

~

Father's Lament. (Compiled from Ossian)
Why bursts the sigh of Armin? Is there cause to mourn? Sad!
I am indeed; nor small my c ause of woe. Dark is thy bed O
Daura! low thy pillow of dust! deep thy sleep in the tomb. ~~have thy pillow of dust!~~ Narrow is thy dwelling now! With three steps I compass
thy grave Fallen is my daughter!. Daura my Daughter! dear to my heart hast thou been thou
event fair; fair as the morn as the hills of Fura—sweet as
the breathing gale. Lead me to the place of her rest, that I
may behold her. – The tomb is at Rushy Lumon, a
stream with foaming course, in a distant land. Pleasant be
thy rest, lovely beam. Soon hast thy set on our hills—thou
hast left us in darkness, first of the maids of Lutha; but
risest like the beam of the east among the spirits of thy
friends! –Cease a little while O wind! Stream be thou silent!
Let my voice be heard on the Heath. ~~[ ] grief I wait~~
Weep

Weep thou Father of Daura weep; but thy Daughter heareth the not.
Deep is the sleep of death! Silent forever! No more shall I hear her voice—no
more shall she wake at my call. Pale in the earth is she, the softly blushing
fain! When shall it be morn in the grave, to bid the slumberers awake?
Will none speak in pity? – Thou are gone forever! The mourner shall
sit on thy tomb, but behold thee not. Farewell! thou silent beam.
We too shall be no more. – Here I am in the midst of sorrow My sighs
arise with the beam of the east; my tears descend with the drops of night!
Why did I not pass away like the flower of the rock that lifts its
fair head unseen and and strews its withered leaves on the wind?—
Sweet are thy murmurs, O stream! but more sweet is the voice
I hear. It is the voice of Alpin, in song of songs mourning for the dead.
Alpin my son, why alone on the silent hill? Why complainest
thou as a blast in the wood – as a wave on the lonely shore? Mourn-
ful is thy tale! – Lonely sad, along the Heath he slowly moves with
silent steps. The tear in his down cast eyes, his sighs rise at times,
in the midst of his friends, like blasts that shake their unfrequent
wings after the stormy winds are laid. The maids are departed to
their place and thou alone mournest there.—Desolate is the
dwelling of Daura -- silence in her house! Silent is the hall of my
joy. I sit in my grief – I wait for morning in my tears – my life
flies away like a dream. Why should I stay behind? – Bring not
Carvil, bring not her memory to my mind – my soul must melt
at the remembrance – my eyes will have their tears. I have not the
voice of the bard – the sons of song are gone! – But I will remem-
ber her – I will see the place of her rest – Roll on ye dark brown
years

years for ye bring no joy on your course! My voice remains
like a blast that ?? on a sea surrounded rock.
after the winds are laid: the dark moss whistles there. I am
sad! nor small is the cause of my woe.

Notes and Illustrations

The foregoing lament is compiled from the Poems of
Ossian and is nearly in his language as given by
MacPherson. No variations are admitted excepting
those necessary to preserve the unity and these are few.

"Why bursts the sigh of Armin!" Armin the Father.
"Daura" the deceased Daughter
"Rushy Lumon a stream with foaming course" This will apply
to the Hudson generally above Fort Edward and particularly in
the vicinity of the interment of my Daughter. There the
River falls down a prodigious steep called Glens Falls and forms a picturesque
and

and magnificent scene. The cataract is uncommonly variegated, wild and roaring, insomuch that it is impossible to give any tolerable description without a plan and view.

"Alpin" – the bereaved husband.

"Why alone on the Silent hill" The burying ground is on an elevated land overlooking the River and Cataract, a little west of the village.

"Cevvil", one of the bards mentioned in Ossian

"Lutha" may represent Deerfield, Fanny's native place.

"Glen's Falls, is a village on the left bank of the Hudson about 50 miles above Albany; 9 miles from the south end of Lake George and three miles above Sandy Hill a village near the site of old Fort Edward. The country in the vicinity of Glen's Falls is rendered interesting by the many singular occurances mentioned in the histories of our wars. A few miles north, on the road to Lake George, in the year 1755 a body of provincial troops under the command of Col. Ephraim Williams, Brother of Doct. Thomas Williams formerly of the town, were ambuscaded & defeated by a party of Indians: the Colonel and many valuable men, from the & other towns in Hampshire & Berkshire, were killed. In 1757 near the same place, a horrid massacre ~~tooke place~~ of the Garrison of Fort William Henry, which had surrendered to the

French General Montcalm, took place, in which several
officers and soldiers from Deerfield were sufferers. In 1777 Genl.
Burgoyne's Army surrendered to the Americans, at Saratoga
about 18 miles below Glen's Falls, after two hard fought
Battles near Stillwater, a little below the former place.
The savage murder of Miss McCrea, which excited such uni-
versal horror, at the time, was perpetrated near Fort Edward in
the same year by a party of indians attached to Burgoyne's Army.
The country around the falls has been settled since the Revolution-
ary war, and is now considerably populous.]

Many of the exploits American partizan, Major
Rogers, in the war of 1755, were performed about Lake George
and the south end of Lake Champlain, not far distant from
the Falls – In Roger's Corps were many men from this section
of the Country. Not far from halfway Brook, near Glens falls, in 1758, a party of
our troops and many teams were cut off by a party of French and Indians

Note. The teams were cut off between Glens Falls & Sandy Hill
at Cold Brook near Sandy Hill – as stated by Abraham Wing
and others. This affair is sometimes represented to have been
near Halfway Brook – an error.

Elegy. By a friend

Our sympathies will oft inquire
O why and wherefore is it so?
Must fondest hopes so soon expire?
The bitter cup o'erflow with woe.

Will youth and health and friendly care
be no efence against the stroke?
No – all such hopes are built on air,
They're brittle day and must be broke.

Of all the gifts of bounteous heaven
To cheer the friendly circle here
This Child we thought in mercy given,
But now alas! must disappear.

Far distant from a Father's care,
And from a mother's fond embrace;
No Sister's friendly aid was there,
To calm thy fears, or view thy face.

Deni'd

Deni'd the mournful pleasure too
Of weeping o'er thine early grave;
Naught remains for us to do,
But try the Infants life to save.

Let this a faithful emblem be;
Thy features in its face appear,
This treasure representing thee,
Shall prove a blessing doubly dear.

22==25 Extract from "Thoughts on Faith From Mr. Butler's Posthumous Works." See London Magazine August 1759.

Almost all the miracles in the Jewish history, from their deliverance from their first slavery, by the plagues of Egypt, to their second captivity in Babylon were performed by the destruction, ruin and calamity of mankind – But all those that our Savior wrought to confirm his Doctrine, quite contrary, by raising the dead to life, curing of disparate diseases, making the blind to see, casting out devils, and feeding of

The child we named Frances Hoyt Dickinson. On the Friday the 29 of July 1825, he with a son of Col Ashley, a young lad, went into Deerfield River to bathe. Fran ces got into deep water and was drowned. He was a very active Boy, and in some particulars, prom ised to make a likely man. The loss was severely felt by his con nections.

hungry multitudes, &c. but never doing harm to any thing;
all suitable to those excellent lessons of peace, love charity
and concord, to which to which the whole purpose of all that he did
or said perpetually tended. – Whosoever, therefore, does en-
deavor to draw rules, or examples, for the practice of christian-
ity, from the extraordinary proceedings of the Jews, must of ne-
cessity make a strange confusion and adulterate mixture
of the christian religion, by depraving and alloying it with
that, which is so directly averse and contrary to its own
nature. And as this unnatural mixture, of two different
religions, was the first cause of dissention among the Apos-
tles themselves, and afterwards determined and resolved
against by them all: So there is no doctrine of rebellion,
that was ever vented among christians, that was not
revived and raised from this kind of false and forc-
ed construction."

"The enmities of religious people would never rise to such a
height, were it not for the mistake that God is better served
with their opinions than their practices; opinions being very
inconsiderable, further than they have influence upon
actions.

All reformations of religion seldom extend (further)
than

further than the mere opinions of men. The amendment of their lives and conversations, are equally unregarded by all churches, how much soever they differ in doctrine & discipline. And though all the reformation our Savior preached to the world, was only repentance and amendment of life, without taking any notice at all of men's opinions and judgments yet all the christian Churches take the contrary course, and believe religion more concerned in one erroneous opinion, than all the most inhuman and impious actions in the world."

23==26 Copy of the Letter from David F. Dickinson, my son in Law, announcing the Death of my Daughter Fanny. (See Art. 21)

Glens Falls Jan (Eve.) 13th 1817

Respected Father,

On the 8th instant we were blessed with a Son. The mothers sufferings were then deemed light. But this day has been clothed with suffering and woe. A relapse hath occurred, that shields around a doubtful uncertainty. Cheered only by hope I evade despair! The morrow is uncertain! The first medical knowledge of our Section of the Country is aiding in restoring to health

health the dear wife, the mother and the affectionate daughter. If that fails to relieve, another day closes the life! O eternal Power! (I will omit till morning.)

Morn of the 14th instant The close has come! She is no more! The disease of which she died was a putrid fever, or child bed fever.‡ O Where shall I find consolation. I am too full of woe for communication. The mail is leaving. I shall write the 16th instant.

From you suffering son,
D. F. Dickinson

E: Hoyt Esqr

Note The above letter having been mislaid, could not be inserted in its proper place, at the head of Article 21~

‡puerperal fever the real name

24==27 Singular Electrical Phenomenon, communicated to the Editor of the Vermont Republican; by Joel Manning Jr Esqr of Andover in that State.

On the evening of the 18th of January last (1817) there was a heavy fall of snow accompanied with lightning & thunder. Coming out of a Neighbor's house, in company with a young man, between ten and eleven (evening) we noticed that the snow fell very fast, but our attention was particularly attractedby the frequent flashes of lightning. After passing a few rods we observed on the top of a stake in the fence a light resembling a blaze of fire about 2

or 3

or 3 inches in length, though not so red and brilliant. We soon observed that on every stake was a light, and also on the highest branches of bushes by the side of the field. we soon observed it on our hats, hair, and mittens, when held up, not in the form of a blaze, but of bright white sparks of various sizes, from those which were just discernable to those of the size of a large buck shot. We found that on any thing that was totally tolerably smooth & without limbs, there was no light except at the top. We viewed those blazes at the distance of about 1 ½ foot; their form was precisely that of an inverted Cone standing on the smallest possible point, whose hight to the Diameter was as 3 to 1. On one stake were three of these blazes, On 2 or 3 stakes, upon which they appeared the most vivid, they emitted a sound resembling the hissing of the water in a tea kettle just before it boils and could be distinctly heard at the distance of 10 or 12 feet. Those blazes would disappear at the approach of a stick (viz a whip staff) within less than two feet. In this experiment the top of the staff was higher than the stake. Passing over a piece of rising ground on our way homeward, our hats and shoulders were almost covered with this light, and when we spit the small particles at the distance of 6 or 8 inches from the mouth assumed a shining appearance. these lights were to be seen for ¾ of a mile except when by the side of, or in a piece of standing timber. About 12 o'clock we returned and there appeared full as much or more light on our clothes, but no conical figures and no hissing.

The light was only visible on high land at some distance from standing timber. Light might have been on the forest trees, but they were not perceived through the falling snow. The experiments were made near the ground, but the higher in the air the greater was the light. It increased very fast from the height of the head to that of the arm extended full length, when it was almost doub led. In this experiment the wind increased the light. Stand with the back to the wind, raise the arm about 2 inches from the breast so high that that a spark would appear on the highest point of the mitten, turn facing the wind, with the hand in the same situation, and there would be more and larger sparks. The conical blaze and hissing was perceived only on the highest bodies, such as the highest stakes &c. On briers of equal height with the stakes there were no lights; and no hissing or conical form unless the stake was capped with snow, when this was brushed off the light soon disappeared. At the distance of 2 or 3 miles in different directions lights were seen, not in such quantity, but generally one individual light. Similar lights are said to have been seen by people passing over high grounds in Reading, 18 or 20 miles north of Andover.

The above is the substance of Mr. Mannings account as republished in the Franklin Herald March 4 – 1817. Similar Phenomina were observed in several towns westerly of Deerfield, particularly in Heath, Conway, Dalton, and several towns westerly of Brattleboro Vt. In Deerfield it rained during part of the time mentioned with lightning & thunder. It

was

It was noticed that the lightning was very frequent; --
almost universal over the heavens and generally attended with
the usual zigzag streams.

From the foregoing statements I conclude that the clouds,
and perhaps the whole atmosphere, over the places
noted, were highly charged with electricity, probably
of the negative kind as is indicated by the divergency of the cones of
light at the stakes. ~~whatever divergent~~ ; and that all
conductors of electricity: gave off the electric fluid
to restore the equilibrium between the clouds and earth.
The circumstance of the phenomenon being more conspicuous are
high grounds & the cones divergent seems to justify the above conclusion; and it is
highly probable that on the top of standing trees lights
might have been seen by an observer placed above them.
Why the equilibrium was not restored by ~~the most~~ violent
streams of lightning, and by what means the clouds, and
atmosphere became so highly charged, is not easily explained.
The phenomenon was certainly singularly curious, as well
as uncommon, and well worth the attention of the philos
opher.
The experiment of the electrical kite communicated by Mr. Baldwin
to the American Academy of Arts and Sciences, and recorded in the
1st Vol of their transactions, will throw some light on the above
phenomenon~

25==28 Of General Scott

Among the general Officers employed in the late War no one has ~~has~~ acquired more fame than General Winfield Scott. By the historians he is spoken of in terms of the highest commendations; as the boast of his country; the pride and darling of the Army &c. Of his bravery I think there can be no doubt: in the Battles of Queenston, at Fort George, Chippewa and Bridgewater, or Niagara, he evinced a bravery bordering on daring, & his talents as a disciplinarian are undisputed. But whether he possesses that esprit genie militaire which is peculiar to great generals we have yet to learn. Without this a conquerer can neither be called a hero, nor an able general, but only a lucky soldier. A man may be brave as Ceasar yet lack all other qualities of an able general; he may also be thoroughly acquainted with all the minutia of the parade and yet be unfit for command. "The drill," says a military writer, "never formed a general." To be such, God in the bounty of his providence must have caused him to be born a great man. On the contrary the pursuits of little objects must narrow and shackle the mind. Those habits which insure mediocrity will almost, always preclude excellence. A special pleader is not a Somers or a Clarendon; nor is a good Adjutant a great General. There is hardly any man so humbly gifted by nature, that with sufficient application cannot become

become the former. To constitute the latter requires the assemblage of some of the noblest attributes of our nature; that power of mind, that grasp of thought which seizes almost every thing as if by intuition; which thinks, decides, and acts in the same moment; which forms the best possible judgment in the shortest possible time; which is not only cool and collected but is roused and excited by danger; must all be united to adorn the character of a great general. Add to these qualities great powers of discrimination, a constant attention to the study of the higher branches of his profession, an anxious imitation of the great models which antiquity and modern times afford, and above all, the possession of that military imagination of which the king of Prussia speaks in his instructions to his Generals, and without which there can be no excellence or superiority"

Bravery without doubt is one of the first and most important qualities of a general; but this without genius will but illy qualify him for the multifarious duties of his profession. Bonaparte was so thoroughly impressed with the truth of this, that after one of his Battles in Italy, having praised one of his chiefs of Brigade for his great bravery in the action sent him to a garrison town with this remark "No man could have fought

his

his troops with more intrepidity than you have, but you
do not possess the genius and talents of a commander."

General Scott may possess all the talents of an able command-
er, but opportunity, I think, has not been given to prove whether
he does or not. He has seldom been intrusted with a separate command,
I believe never in a general engagement. I am certainly prepossessed in
his favor and think him eminently qualified in some particulars
for a General, and should not hesitate, were I to chuse, to assign to him
a high command. I only say he wants more opportunity to demonstrate
his talents to his country. The principal question is whether he
is as <u>prudent</u> as he is brave? This quality is as necessary as the whole
collective assemblage of the others that constitute the able general.
To rush suddenly upon an enemy without regard to his strength or profession,
thinking only of beating him, and without a preconcerted plan of
retreat in case of a repluse, is to put too much at hazard and
may be followed by the most disastrous results.

General Scotts attack on Drummonds army, July 25_1814 at Nia-
gara, has by some been considered by some as bordering on rashness.
The detail of this action may perhaps show whether this opinion is
correct. On the 25th of July General Brow[n]'s army lay encamped at
the mouth of the Chippewa, and not being apprized of the arrival & junction Drum
mond an[d] Ryall, he ordered Scott's Brigade to march rapidly upon Queenstown

about nine miles down the River. This movement was made
in consequence of information which Brown had received (which afterward
proved to be false) that Ryall had detailed a large body of troops
across the Niagara to Lewistown. Scott received the order just as he
had formed his Brigade for the usual drill and it was promptly
obeyed. The whole force under his command consisted of four
Battalions under Col. Brady, and Major Jesup, Leavenworth and
McNeil, together with Towson's company of artillery, making
in all 920 men, the piquets & guards being left behind. To these
were added Harris troop of light dragoons & some some mounted volun
teers, making an aggregate of 1050 men. At nearly three miles
from Chippewa the enemy were discovered just in the vicinity
of the cataract of Niagara, drawn up on a ridge running out at
right angles from the Niagara. This discovery was reported to Genl.
Brown at Chippewa. Scott resolved on an immediate attack
after communicating his resolution to Brown he advanced upon
the enemy and by the time the message was delivered the action
had commenced, and had already become close & general
some time before the remainder of the army with Brown
crossed the Chippewa.

The enemy had already 1500 men in line; the remainder
of Drummonds army were on their march from Fort George

&

and arrived successively at intervals of 15 & 20 minutes. The action commenced
half an hour before sunset and lasted till about half an hour after
eight with various success. The ground in front of the British line
was level and open; in the centre ~~of this line~~ was a small eleva-
tion supported by a pair of artillery commanding the plain in
front. The Americans fought with the greatest resolution and had
turned and beaten the right and left wings of the British out of the field
and taken prisoner Genl Ryall, the center alone remaining firm, when
General Brown arrived with the reserve, after the action had raged
for an hour & forty minutes. On his arrival Brown assumed the com-
mand, interposed a new line and disengaged Scotts Brigade, which
had suffered severly, and held it in reserve. The action was then
renewed; the Light and artillery of the British carried, by a gallant
charge of Millers Regiment. The enemy rallied renewed the charge
and attempted to regain his artillery but was repulsed. About half past
10 o'clock this action ceased, both armies holding the ground then occupied.
Soon after the Americans left their ground, retreated to Chippe-
wa & soon after to Fort Erie and the British recovered their cannon and one left by
the Americans. Genl Scott exposed his person in the most
undaunted manner during most of the action and just at the close
was severely wounded by a musketball through his right should-
er and had two horses killed under him. His aid Warth & Brig-
ade Major Smith were both wounded at his side. The total loss of
his Brigade was 490 in killed and wounded out of 920 including
in this number more than 30 officers.

(For Continuation.)

29. Comet discovered

July 4 1819 } Sunday evening about 8 o'clock a Comet was discovered in the northwest part of the Heavens. The nucleus and tail were very distinct.

July 5- At 8-50 by watch Commets azimuth from the west taken by Academy Theodolite 58°~30'. allowing 5°..30' for ?? ??? Alt at same time 9°~12'

From the above it appears that the Comet was in or near the Lynx at the time of observation. The Comet was seen at Newhaven July 3rd and at Cambridge the same Day. At NHaven RA, at 9H-4m-7s,= 103°,5'8 Declination 45'~17' North, as stated in Springfield paper at Cambridge. RD 95°. Declination 50 as stated in [?] Dist from arturus 88°~45

Lyna----------92,18 Place between breast of Lynx and Auriga

New System of Cultivation Ma. General Alexander Beatson late Gov. of St Helena is the author of this work; an Edition of which in a large Pamphlet is published in Philadelphia this year 1821. The cultivation of arable land is without Plowing dung Lime or Summer Fallows. A Scarifier is used instead of the plow and various harrows; burnt clay for manure. The surface of the ground is burned to clear it of weeds. The burnt clay is supposed the best manure; and it produces no weeds &c.

27=30 Bearings of Places

Bearings taken from the prospect Rock, on the summit of Deerfield East mountain, Sept 12, 1823. The station called A.

1. Steeple of Northampton Meeting House S14°-12'W by Academy Theodolite
   Do -- S13+W by my Hanks compass
2. Highest peak of Mount Tom -------- S14°48' W by Theodolite
   Do-- ---- -- S14 00Wby compass
3. Steeple of Muddy Brook Meeting House S16°~30'W by Theodolite
   Do --- --- -- Do S16.00Wby Compass
4. Steeple of Whately meeting house S25°~00W by Theodolite
   Do --- -- - - S24..00 W by Compass
5. Daves House SE angle top Barrs Long hill –S46°-54' W by Theodolite
6. Summit of Saddle mountain in Will.T. N69-45 W by Theodolite
   Do- - - - - - N 70-15 W by Compass
7. Steeple of Greenfield meeting house - - N. 0 – 30 W by Theodolite
   Do - - - N 1.15 W by Compass
8. Steeple of Deerfield meeting house - - - N 32:00 W by Theodolite
   Do - - - N 32.45W by Compass

Here it appears that the instruments used in the observations differed a little more than a degree in the Bearings. In those south westerly the Theodolite gave the greatest angles; and in those NWesterly the compass gave the greatest angles, uniformly. Both are called good instruments.

The above bearings are from the magnetic meridian; the Variations 5°-30' West (nearly).

Bearing of Russells Prospect house from Banks of Deerfield River at Marceys House S4.30E by compass. Course from said Marcey's point to SW∠ Deerfield Street E4N° by Compass 44 Rods. Corner of Street N15E (westline) to meeting house ½ mile. Bearings

Bearings of Places

Bearings taken with a good pocket compass Sept—1823
From Aaron Dickinsons in Hatfield, at the north end of the Pantry Road
to Deerfield meeting house, as nearly as could be determined without
a view of the said Meeting house, N13°E.
From said Dickinson to south sugar Loaf N30°E
From Do Russells Tavern in Muddy Brook in Muddy Brook N25°E
From said Russells to Whately meeting house, taken from the
top of the former S34W
The above are not to be ruled on, for accuracy.

bearings taken from the Prospect house SW∠ on sugar Loaf by Hawks compass, August 8, 1822.
Shelburne meeting house N23°-30'W. Muddy Brook meeting house (the spire) N27~30W-Whately do S52-20W. Northampton do. S16-30W.
Highest point of Mount Tom S16'W_ West Springfield meeting house S8-30W.- Hatfield do S7-40W – Hadley do S7'W—west prospect house on Mount Holyoke S4-30W – Amherst meeting house S23~20E – Belchertown do. S31-20E – Sunderland do S60~30E.
Wendell do N52—20 E.

August 13 Bearings taken in the Banister of Deerfield meeting house
High peak of all Town S19-W—Rock (prospect) on Deerfielf Et Mons. S32~30E—To Davis house (SE∠) S24W—To spire of Greenfield Meeting House N9E. Note observations by Theodolite)

Bearings of Places

Course run by my Brother, Col Hoyt, several years since, from Half way Brook between N Hampton and Hatfield N16~20E – full 20 or 30 rods east of wappin Longhill.

Bearing of Mount Tom (highest peak) from a point 6 rods Et of the Brick meeting in Greenfield Village, by Theodolite, S12~39W. Deerfield Street lies a little East of the above line, as, I concluded, does North ampton Village. The bearing from Deerfield Steeple to mount Tom as taken August 13 – (see opposite page) is 39 minutes less than the one above. But it should be more. Hence I conclude the needle was effected by the iron about the bell as I apprehended at the time.

Bearings from Prospect House on Sugar Load (SW∠) Sept. 15-1823 by Theodolite.
NHampton Meeting House S16~45W. Peak of Mount Tom S16-24W Whately meeting house (spire) S52.41W—Aaron Dickinsons at Pantry Road S31—45W (supposed house) – Muddy Brook Meeting house N27W (spire) – West house on Mount Holyoke (SW∠) ~~S5W~~. S4~44W- Hatfield meeting house S8W- Amherst Meetg house S22-44E -- SE∠ Russells Tavern, N52W (distance 1 mile about) Course of Muddy Brook street N41E (south part of Do at Russells.) Distance from Cooleys Shed [?] adjoining his barn to center of Muddy Brook Steeple 174 Rods: from said Steeple to the apple tree (the proposed point of departure from the North end of

Muddy Brook Street)
to wappin Long hill 289 Rods, by measure, then by wappin to
south end of Deerfield Street as measured by our Selectmen. 1015 Rods
Route from same to same by Barrs as stated by Mr. Ware (as he
says taken by selectmen) 1068 ~

Bearings taken in the Steeple of Whately meeting house Sept 18 – 1823

To Aaron Dickinsons house commencement of pantry Road S3E
Wt point of Mount Tom S8:45W – West house on Mount Holyoke
S8:30E – Hatfield Meetinghouse (spire) S20E – Greenfield
Church (Strongs) N15E – Smiths house at Mill River N3 1/2W
(about 2 miles) – Course from SW∠ Capt Graves door yard, to a pine
in the direction of of fire as seen when Sheriff Lymans Barn was burned
at N Hampton S6W: said Graves point is 6 rods SE of center of
Whately Steeple. By Compass: Needle perhaps affected by Iron about Bell

Bearings from SE Davis house at Barrs Long hill to Muddy Brook
Steeple S17-30E. From Do house to Deerfield Steeple N23:30E – By
Compass ~

_____

Observation for distances ~~for as~~ by a series of Δs, made at Muddy Brook.
Objects chosen. The spire of Muddy Brook meeting house A the center off a shed
joining Capt Coolys Barn C (on east side) and the SW∠ of prospect house on Sugar
Loaf B. ~ viz ∠ A56~44} by Theodolite (taken on the limb without the needle)
∠C96~39 See Fig
sum153-23 this from 180=26°-37'=∠B
Base AC, carefully measured by Chain on level ground=174 rods

Then for distance BC

	Logarithm
1- Sine ∠ B= 26..37=	9.651297
: 174 rods	2.241795
:: Sine ∠A=56..44	9.922272
	12,164067
rods	9651297
(BC) : 325.6	2.512770

For BD.

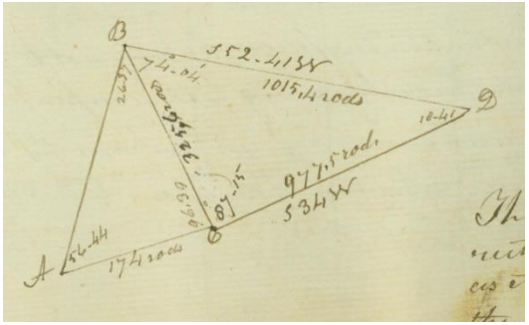
3d. Sine ∠D	9.505608
: BC=325.6=	2512770
:: Sine ∠BCD	9.999500
	12,512270
	9505608
: BD=1015.4 rods	3,006662
= 3 miles 55,4 rods	

For distance from Cooleys shed C, to Whately meet inghouse cupola D.

∠BCD= 87°-15'
Course of CD=34 00 Southwest, subtract
S 53.15 E course of CB.
or N 53..15 W
S 52.41 W course from B to D.
Sum 105.56 And 180°--105.56 = 74°.04'= ∠CBD. Then BCD = 87°--15 + CBD=74-04= 161°-19° = B +C. Consequently 180°-161.19 = 18°..41'=∠D.

2d—Their Sine ∠D=18-41	9.505608
: CB= 325.6 rods	2.512770
:: Sine ∠CBD=74.04	9.982986
	12,495756
	9505608
:977,5 rods =C Do	2,990148
= 3 miles 17,5 rods.	

Therefore from Cooley's shed to Whately cupola is 3 miles 17.5 rods
and from SW∠ prospect house on Sugar Loaf to same is 3 miles 55.4 rods.



Note. The shed C is a few rods SW of Russells Tavern on the south of the Lane. The ∠ CBD is deduced from the magnetic Bearing of BD.

The accuracy of the results depends on the cor rectness of the admeasurement of the Base AB. And as it is probable this may not be perfectly true the others lines may not be ~~true~~ perfectly so.

Observations made on Holyoke SW∠ west prospect house (Station E on map)
Magnetic Bearings with Theodolite.
Whately meeting house (spire) N7—30WHadley Do N2~30W—Hatfield do
N1E – Russells prospect house on Sugar Loaf N5 – 15E Muddy Brook
meeting house (spire) N2°E – West Springfield do. S14~30W – Chapel at
Military works at Springfield S11W – Saddle Mountain N45-30W.

From Station F on map viz Roof of Northampton meeting house close
to the North side of cupola the following Bearings were taken with Theod-
Hatfield Steeple N32—30E—Hadley Do N53E—Deerfield prospect
Rock N13-30E—Amherst meeting house (spire) N63-30E.—

The air being hazy. on the day of observation (25 Sept)distant objects
could with difficulty be seen, and the pleasure of the prospect was
much diminished. The mountain presents a sharp summit of small
width; the declivity south much more gradual ~~south~~, than on the
north side, which in many parts is abrupt.

The magnetic bearings, as needed in the preceding pages, appear not to coincide
when made from different points, probably owing to the imperfect
manner in which the angles were read off—and perhaps the needles
may have been affected by some attraction of the mountains and
the iron in the cupolas of the meeting houses, where the observa
tions were made.

31 Hydrodynamics

Discharge of water over weirs, or dams, a waste-board on the top.
Let D= the quantity of water discharged in cubic feet
L= the length of the waste board= 18 1/3 inches
H= its depth
M. Buet has given the following formula reduced to English inches: The formula, as altered by Dr. Robinson is

$D = l.\sqrt{130.032}H^3$ or

$D = 11.4172\ L\ H\frac{3}{2}$

That is, multiply the square root of the cube of the depth of the upper edge of the waste board and below the surface, by 11 ½, and by the length of the waste board, and the product will be the quantity discharged in English inches

Note when the water is quiescent the rule os good; but if it happens to reach the opening (or full) with any velocity, multiply the area of the section by the velocity of the stream.

see Edin. Ency. Art Hydrodynamics
Vol. 10 p 840

approved writers on Hydrodynamics.

Chevalier Buat Traite d'Hydraulique et Pyrodynamique 2 vol 8vo 1786 &third vol 1816
Promy. Nouvelle Architecture Hydrolique 2vol Paris 1790
_____ Recherches Physio Mathemathiques sur la Theorie des Eaux Courantes 4to Paris 1804
Eytelevein, Hand buch der Mechanik und der Hydraulik Berlin 1807.
Robison. System of Mechanical Philosophy vol 2 & 3. See Edin, Ency. vol 10th p 767

32. Books in the Atheneum Boston 1827 (and other Catalogues)

Brewsters Treatise on new Philosophical Instruments 1vol
on mathematical Instruments 1 vol } athenaeum

Entick's (& others) (John) General History of the war of 1755 5 vol 8vo London 1765 athm
with maps plans & charts
Farrar's Elements of Electricity, Magnetism and Electro-Magnetism 1726 Boston 1 vol Cambridge Do
---------- Elements of Astronomy &c 1 vol
Robertson (John) On the uses of Mathemetical Instruments. Atheneum
~~Robin~~sons--- Mechanical Philosophy 1 or 2 vol Do Robison
Major Rogers (Robert) Journal of the late war in America 8vo Lond. 1765
_____ ___ Journals in America 8vo London } athenaeum
_____ ____ Concise Account of N America
_____ ____ Account of America
Trigonometrical Survey of England & Wales. Atheneum
Gregory's of Nature 3 vol 8vo Atheneum
Capt Franklin's Journey to Coppermine river with maps 2 vol 8vo (or Polar Sea) Atheneum
Cogans Philosophical Treatise on the Passions I vol. Atheneum
Blaine's Veterinary Art, or the principles of Medecine as applied to a knowledge of the structure functions &c of the horse & other animals 2 vol 2 vol 8vo plates (Osborn's Catalogue)
Hunter's Complete Dictionary Farriery & Horsemanship 1 vol 8vo (Do)
(Good) Lawrence (John) Philosophical and Practical Treatise on Horses and the moral Duties of man towards the Brute Creation 2 vol 8vo. (Osborn's Catalogue)
Robertson's General Views of the Atmosphere & its connexion with the ~~same~~ sciences, of Medicine & agriculture, including an Essay on the causes of Epidemical diseases 2 vol 8vo
Bingley's useful knowledge 3 vol 12mo.
Beckman's History of Inventions & Discoveries 4 vol 8vo 3d Edition enlarged $11.
Thiebault's Anecdotes of Frederick 2d -- 2 vol. 5 Dollars – Osborns Cat.

33. On Natural History

Natural History appears so interesting and important as to de
serve a place in every system of education, and ought to be taught,
not in colleges merely, but in every parochial school. Informa
tion on this subject, thus obtained, would prove highly useful
in after life. and infinitely more valuable than many of those
branches of ornamental knowledge in which children are ini
tiated. We are far from undervaluing the languages of Greece
& Rome, those valued stores of poetry – ~~but not~~ though not of
science, -- we are equally far from undervaluing the genteel
accomplishments of music, dancing or riding – but we are con
fident, that were the advantages to be derived from the Study
of natural History fairly placed in competition with any, or
with all of these, it would probably be allowed to occupy a
more exalted place, in public opinion than it has hitherto
been supposed to possess. At present the pursuits of the naturalist
are often sneered at, and considered as a degrading employment
to a cultivated mind. We in our time deplore popular ignorance
and regard every object which the Deity has created as worthy
of our notice – whether it be the mite or the elephant, the hys-
sop on the wall, or the cedar of Lebanon, the dull clay or the
glittering marble.

Edin. Ency. Art. Nat. History ~

34. Remarks from Life of Boscovick, Edinburgh Encyclopedia, Art Boscovick
"The habits of abstract thought and close reasoning, which a natural philosopher must necessarily acquire, are utterly incompatible with that quickness of association and versatility of thought, which are the principal sources of extemporaneous decla mation. These antisocial habits, however, are less hostile to his coloquial efforts, than the nature of the subjects with which the mind of the natural philosopher is principally conversant. While the study of history, poetry and belles letters, furnish numerous and interesting topics of general conversation, the man of science is prevented from introducing subjects which would be generally unintelligible, and is thus denied the opportunity of displaying his knowledge and his talents, which is granted to those who cultivate literature and the fine arts." ~

Extract from Mr. Maclure's Geology of the U.S. Phil.Trans. Vol 1 New Series
"When it is considered that less than half the time necessary to give a smattering of any of the dead languages at our academies, would be more than sufficient to give our youth a complete knowledge of the common and useful application of earths and rocks, we may reasonably hope that ere long some portion of time will be appropriated in our colleges & universities to the studies of undisputed utility; and that a knowledge of substances, their properties and their uses, will be permitted in some degree to encroach on the study of mere words. The time is fast approaching when what is called learning will not in all cases be deemed, as it has been in too many, synonymous with knowledge.

Companion with (?)

35. Anecdote of William Pitt Earl of Chatham

Pre (?) to one of the second expeditions during the war which ended in 1763, the minister had given orders to the different presiding officers, in the military, navy, and ordnance departments, to prepare a large body of forces, a certain number of ships, and a proportionable quantity of stores, &c. and to have them all nearby by a certain day. To these orders he received an answer from each of the officers, declaring the total impossibility of a compliance with them. Notwithstanding it was then at a very late hour, he sent immediately for his secretary; and after expressing his resentment at the ignorance or negligence of his majesty's servants, he gave the following commands: ----

" I desire ~~you~~ Mr. Wood, that you will immediately go to Lord Anson; you need not trouble yourself to search the Admiralty, he is not to be found there; you must pursue him to the gaming house, and tell him from me, that if he does not obey the orders of government which he has received at my hand that I will most assuredly impeach him. Proceed from him to Lord Lingonier; and though he should be bolstered with harlots, undraw his curtain, and repeat the same message. Then direct your course to Sir Charles Frederick, and assure him, that if his majesty's orders are not obeyed, they shall be the last which he shall receive from me." In consequence of these commands, Mr Wood proceeded to White, and told his errand to the first Lord of the Admiralty; who insisted that the secretary of State was out of his senses, and it was impossible to comply with his wishes: "however, added he, as madmen must be answered, tell him that I will do my utmost to satisfy him." From there he went to the commander in chief of the forces

and delivered the same message. He also said that it was an impossible business; and the secretary knows it, (added the old Lord); nevertheless, he is in the right to make us do what we can; and what is possible to do, inform him shall be done." The surveyor general of the ordnance was next informed of Mr Pitts resolution; and some little consideration, he began to think that the orders might be complied with in the time furnished. The consequence at last was, that every thing, in spite of impos ibilities themselves, was ready at the time appointed.

Encyclopedia Vol 1 art Pitt

Ship Building, or Naval Architecture, is the art of constructing a ship so as to answer a particular purpose either as war or merchandise Encycloped

36. Rifled Ordnance

In the beginning of the year 1774 Dr Lind and Capt Alexander Blair of the 69th Rgt. of foot invented a specie of rifled field piece. They are made of cast iron; and are not bored like common pieces, but have the rifles mounted on the core after which they are cleaned out and finished with proper instruments. Guns of this condition, which are intended for the field, ought to be made to carry a ball of a basic one or two #s weight, bullet of that weight being sufficient to destroy either men or horse. It need not weigh more than 100 lbs & it carriage about another 100. A couple of good horses may transport 6 of these guns & the carriages of into account.

The rifles make one spiral turn in the length of the bore, but go no nearer the breech there, 2 calibers:and then terminate with a gentle slope in half a caliber more. so as not to prevent the cartridge with the powder from being sent home to the bottom of the gun which would otherwise (?) paper with flamed cartridges, and even with paper and if not made to enter very loosely. The shape of rifles is similar, their breadth [?] = to the diameter, which is $\frac{1}{16}$ of a caliber and the depth = to the sim diameter $\frac{15}{16}$ of a caliber. ~ The bullets are of lead being 6 knobs cast are thus to fit the rifles of the gun. Riz thus made of soft metal, thus do not injure the rifles, and may also save the army the trouble of carrying a great quantity of shot about them, since a supply of lead may be had in most counties from roofs, &

Iron balls may be cast with knobs ftted to the Rifles, or lead knobs may be placed on the balls

these will not wear the gun too soon -- and
the knob will not much relead the Balls.
Such pieces may be loaded almost as quick as
commom field piece. They are sometimes [?]
with a [?] & telescope with cross hairs to hit
sight the marks with more certainty.

Encyclopedia Vol 8 A. Gunnery

137 The Fascinating Power of the Rattle Snake
From Benj. Smith Barton's Memoir concerning the fascinating faculty of Rattle Snake Vol 4 Tran P Philosopher Society

"That the belief of the existence of this power should have been so general among the misinformed part of a people, ought not to be wondered at. The human mind, unenlightened be science, or by considerable reflection, is a soil rich in weeds of superstition and credulity. It is even more prone to believe in the wonderful, even when this belief, as is often the case, brings with it fears, and cares and misery. The bondage of the mind in superstitious credu lity, is great and heavy. Neither religion nor virtue can give it its freedom. This it obtains from science. How important then, even in this point of view, is the enlargement of the mind by science.

But it is, surely, a matter of some astonishment, that this belief should have been in all the fullness of its extravagance, by men of learning, of observation, and of genius: by ~~whom~~ those who have the book of nature in their hands; that book which in some future and some happy age, eradicate many or the prejudices which disfigure and mock the dignity of human nature: by classical scholars, grown old in the disbelief of similar fables heightened and embellished by the charms of poetry; and also by the infidel who denies the authenticity of scripture – miracles, few of which, even though they were not shown to be truths, ane more improbable than the imaginary fact which I am examining."